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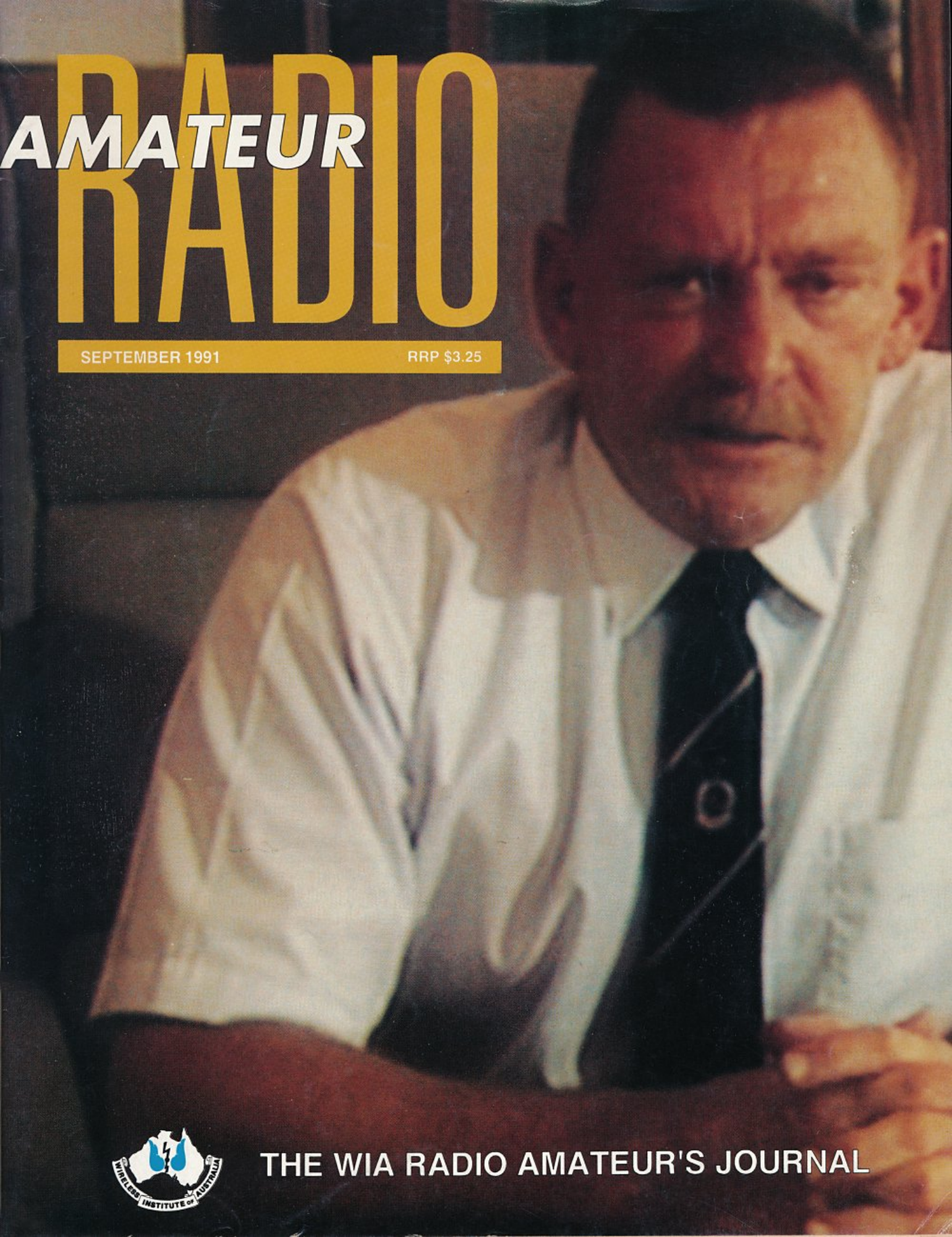

THE WIA RADIO AMATEUR'S JOURNAL

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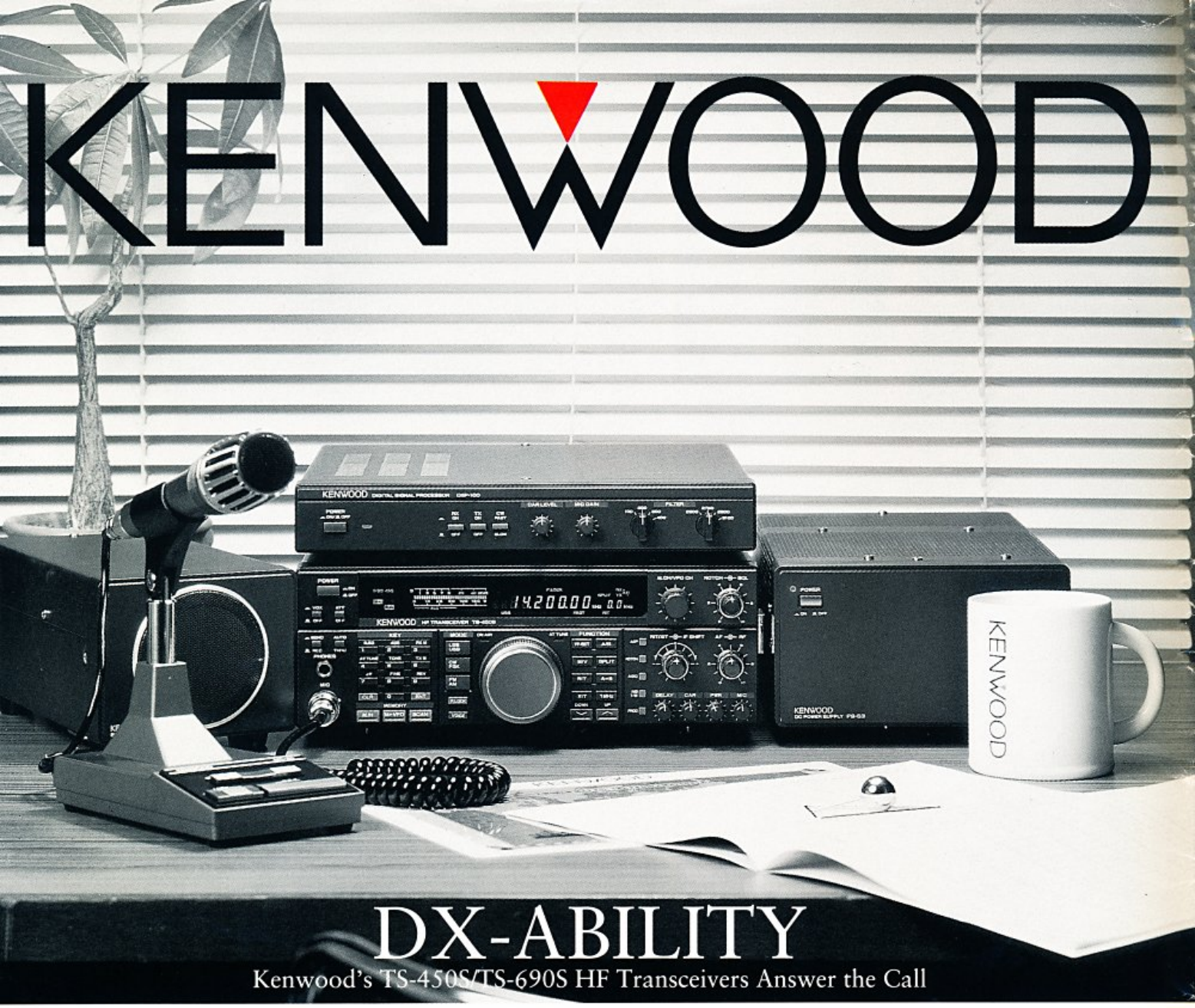

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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Major General B W Howard AO MC, Director General NSW Emergency Service. For his RD opening address and profile, please see page 7. Photo by courtesy VK2 Division.

EDITOR'S COMMENT

Bill Rice VK3ABP Executive Editor

Mind Broadening

While Graham Thornton was finishing last month's editorial, my XYL Margaret and I were putting up a tent at the Burke and Wills Roadhouse, halfway between Cloncurry and Burketown in far north-west Queensland. We had left Melbourne on 29 June, driven to Adelaide, and travelled thence by the celebrated "new" Ghan to Alice Springs, arriving 2 July. A magnificent train, indeed, with something like 30 private vehicles on flat-tops at the back. Our Commodore station wagon was one of them.

We left Alice on 5 July and travelled via the Devil's Marbles, Tennant Creek, Barkly Homestead, Mt Isa (three nights), Cloncurry, Burke & Wills, Lawn Hill National Park (three nights), Escott Resort, Burketown, Normanton, Karumba (two nights), back to Cloncurry, thence Longreach, Barcaldine, Blackall, Charleville, Cunnamulla. We were into VK2 and only 76km from Bourke when our elderly engine spat all the teeth from its camshaft drive wheel! We spent a week in Bourke, leaving on 28 July with a reconditioned changeover engine. A night at West Wyalong and we were home in Melbourne on the 29th, with nearly 7000km more on the odometer.

Why have I gone into all this detail? Because I thought you might be interested in the resounding success of amateur communications throughout the journey. Except for the few days when the car was locked in the garage overnight at Bourke, we maintained contact with Ron VK3OM at Upper Beaconsfield twice a day, first after check-in to the Travellers' net at 1230, then every night at 2030 (later 2000). Usually the night QSOs were on 7MHz, as the skip on 14 was too long, and until well south of VK4 our old favourite 80 metres couldn't compete with the QRN! One lesson here was that our "new" (WARC 79) 10.1MHz band would be ideal for round-Australia mobile. Unfortunately, we had no mobile whip for this band. Next time, for sure. The maximum distance between us would have been about 3000km, minimum about 500. Of course we worked many others besides Ron, but he was the most reliable of all at keeping skeds! We met about a dozen amateurs from various places in various places (not necessarily on their home ground). It was interesting to listen to their opinions about the WIA, in person, rather than being inhibited by regulations. One said he knew of at least six in his club who would not join the WIA until So and So was no longer president of the VKx Division. One left the WIA because he felt he had been insulted. Another was strongly convinced that no-one should be allowed to get an amateur licence until s/he was a WIA member. Truly a wide range of opinions! I would like to plead with those of you who do nurse some grievance with the WIA. You may not be able to do much about it as a member, but you can certainly do nothing at all once you've put yourself out! Whether you, one person, belong to the WIA or not may have little effect on amateur radio in Australia. But if you, and we, all thought like that, there would be no WIA, and the effect would be disastrous! The WIA is bigger and far more significant than any one person or group. Stay with it and make your voice heard! We know we're not perfect, but your membership may be just what we need! **ar**

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Packet Radio and VK3WIA

If you are a packet radio operator you may have noticed the monthly WIANEWS items that are disseminated from the Executive Office of the WIA through the Bulletin Boards network by VK3WIA. VK3WIA is the callsign of the station operated by the Federal Body of the WIA.

You may also be one of those who has attempted to send a message to VK3WIA and wondered why you never received a response.

The reason is fairly simple. VK3WIA is used only for the outwards dissemination of news relevant to the Amateur Radio Service.

One of the regulations governing the operation of amateur radio stations is that a station shall not be used *"to transmit material relating to industrial, commercial, political, social or religious matters"* (DOC 71, para 9). Unfortunately, almost all messages for the Executive Office relate to items such as changes of address or callsign, missing Amateur Radio magazine, or subscription matters etc., which are all to do with the commercial operations of the WIA. Therefore, they fall under the heading of *"commercial matters"* and are thus outside the amateur service regulations. In fact, it could be argued that any messages for the WIA, except for simple *"greetings"* messages, are strictly commercial in nature.

Like all radio amateurs, the WIA does not wish to operate outside the regulations. Hence, VK3WIA does not accept incoming packet traffic.

The correct vehicles for such communications to the WIA are either the telephone, fax or postal service. These services are generally more reliable anyway.

Contact information for the WIA is detailed on pages two and three of each issue of Amateur Radio magazine. Incidentally, please note that the Executive Office telephone number 523 8191 that for the past two and a half years, has been a shared voice and fax line, is now a dedicated, 24 hours a day, 7 days a week, fax line. The main telephone number of 528 5962 now has two lines.

Quarterly Executive Federal Councillors Meeting

The weekend of 20th and 21st July 1991 saw an extended meeting of the full Executive and Federal Council of the WIA. Councillors attended from each Division, allowing a wide range of topics to be covered that cannot be finalised by the limited number of Melbourne-based Executive at the monthly meetings.

Apart from the regular and important business of finance, correspondence and recruitment, considerable time was

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN	3.570 MHz 2m ch 6950 Rebroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2YEL VK2AOE	From VK2WI at 1045 and 1915 on Sunday on the following frequencies and modes: (*1045 only): 1.845 AM; 3.595 AM morning and SSB evening; 7.146 AM*; 10.125 SSB; On relay 14.160 SSB* and 21.170 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; On relay 584.750 ATV sound; 1281.750 FM. Plus automatic relays to 2m repeaters surrounding Sydney and manual to several country repeaters. News headlines by phone (02) 552 5188.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0830-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Bob Lees Eric Fittock	VK4QA VK4ER VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland - Thomas	VK6LZ VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 146.700 at 1900 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

devoted to discussion of the forthcoming change to the examinations system, services provided by the WIA to members, the production of guide-lines for the use of packet radio and for the shutdown of repeaters, and further deregulation of the Amateur Service.

David Wardlaw reported on the status of the WIA preparations for WARC 92. Ron Henderson commented on his reply, on behalf of the WIA, to the House of Representatives discussion paper produced as part of its Inquiry into the Management of the Radio Frequency Spectrum. Ron Henderson also outlined the contents of the papers that have been prepared as the WIA's submissions to the IARU Region III conference in Bandung in October, to which the WIA will send four delegates.

Some time was given to discussion of the WIA objectives for 1992. It was noted that the October weekend meeting will be the time to set the 1992 budget and the Federal component of the membership subscriptions. It was also noted that the current air-fare war has allowed the WIA to save a considerable sum on member transport.

In all, the weekend extended over about 17 hours of formal meeting as well as several hours of informal discussion. A long, hard working and tiring weekend for the WIA Executive and Federal Councillors, particularly those who flew in from the more distant Divisions.

SEANET '91

The Executive Office has recently received brochures about the 1991 SEANET Convention, to be held in Chiang Mai, northern Thailand, from the 8th to 10th November 1991. The brochures contain a registration form and details about the organisation of the Convention. Individual amateurs wishing to receive copies of the brochure should contact the Radio Society of Thailand direct at GPO Box 2008, Bangkok, 10501, Thailand.

IARU
Region III
Conference

At the recent quarterly meeting of Executive and Federal Council, Ron Henderson outlined the contents of the papers that have been prepared as the WIA's submissions to the IARU Region III conference to be held in Bandung in October this year. Here is a brief summary of those papers:

Invitation to host the 1994 Region III meeting in Australia
- Australia will bid if it is deemed appropriate.

Report from the WIA
- a summary of the structure and function of the WIA.

Review and revision of band plans
- a statement of the current WIA band plans.

Use of VHF, UHF, SHF bands in Australia
- recent changes in Australian band plans.

Preparation for WARC 92
- a summary of the WIA activities so far.

The matter of future WARCs
- notes the need to consider the frequency and range of future WARCs.

CCIR
- stressing the importance of the Amateur Service maintaining its position with regard to the CCIR, and the WIA input so far.

Funding of IARU activities
- suggesting a reconsideration of the methods used for funding and monitoring expenses.

Involvement in EMC and CISPR
- a report on Australia's position regarding standards impinging on amateur radio matters.

Promotion and development of Amateur Radio in Region III
- encouraging the formation of sister club relationships and international visits by amateurs

Formulation of callsigns
- the present situation with regard to callsigns for amateurs visiting Australia.

Beacons
- the status of HF, VHF and UHF beacons in Australia.

Relaying of messages by amateurs
- the recent change in the Australian definition of *"Third Party Traffic"*.

It will be seen that, for many of these papers, the intention is to inform the IARU Region III Conference of the present situation in Australia. However, in addition, several submissions have been prepared relating to the management and functioning of the IARU and Conference procedure.

The Conference delegation, consisting of Ron Henderson, George Brzostowski, Roger Harrison and Murray Kelly, is to be congratulated on the range of topics covered and the thoroughness of their preparation for this important Conference.

DL
Callsign
Changes

From the ARRL newsletter comes advice that amateurs from the former East Germany are in the process of having their call signs changed to those with DL prefixes. This will take place over the next few months.

It seems that the ITU has asked Germany to relinquish the Y2 - Y9 call sign block next year, for reallocation to another country.

USA
Amateur Radio
Awareness Day

An Amateur Radio Awareness Day will be held in the USA on 7th September this year. The aim is to make the public more aware of the existence, purposes and benefits of Amateur Radio. American amateurs are being encouraged to set up displays wherever possible.

There may be a few unusual voices on air that day.

New Edition
ARRL
Antenna Book

A news release from the ARRL announces that this popular handbook has been reprinted and will be available in the USA as from August. It includes new projects and information on both new and old antenna types. Arrangements will be made for this new edition to be in the WIA Bookshops as soon as possible.

WARC
History

WARCs are very important to the amateur radio service, and WARC 92 will be no exception. Much is being published about this World Administrative Radio Conference (WARC) to be held in Spain next year. Here, for the benefit of newer radio amateurs, is a summary of the history of WARCs, condensed from an ITU newsletter.

The first international conference was held in Berlin in 1903, was attended by 9 nations, and dealt mainly with standardisation of equipment.

In 1906, 29 nations participated for the purpose of establishing ship-to-shore communications procedures. This conference, also held in Berlin, allocated the first callsigns, specified the use of International Morse, and designated SOS as the distress call.

These regulations were expanded at the 1912 conference of 43 nations in London, which also established the Q code.

In 1927, 78 nations met in Washington. Apart from regulating telephony and broadcasting, this conference officially recognised the Amateur Service and allocated frequency bands to the amateurs. It also established Morse Code ability as a requirement for an amateur licensee.

The Amateur Service was first separately defined at the 1932 Madrid conference, which placed restrictions on international message traffic by amateurs.

The 1938 conference in Cairo faced pressure on HF

band space. It was at this conference that the ITU divided the world into the present Regions 1, 2 and 3.

The first postwar WARC, held in Atlantic City in the USA in 1947, had to find spectrum space for several new services. The amateurs lost some of the 10 and 20 metre bands, but gained at 15 metres and also some new VHF segments.

Little change occurred for the amateur at the 1959 Geneva conference, which signed a set of agreements to govern the operation of the world's radio services for the next 20 years.

Similarly, little affecting the amateur service happened at the 1971 conference, also held in Geneva.

The main gain of recent years was from the 1979 WARC, which resulted in amateurs obtaining three new bands, increasing their status in other bands, and gaining new access for amateur satellites.

Amateur Radio in Beijing

A postcard was recently received from Wally Watkins VK4DO who, with VK4s BRG, KLU and QZ, comprise the Australian team in Beijing to participate in the Radio Direction Finding activities. The group are enjoying themselves exploring the country and sharing amateur radio experiences.

Examiners Alert

Last month we published the News Release about the change in arrangements for amateur examinations. Since then **WIA Exam Service** has written to all examiners who were on the list received from DoTC.

However, the WIA is coming to understand that this list did not necessarily include all those people who had applied to DoTC to have papers accredited. Therefore, if there are any examiners who have NOT received a letter from the WIA explaining the new system, WIA Exam Service would be very pleased to hear from them.

Federal Awards Manager

It is with regret we announce that Phill Hardstaff, who took on the demanding task of WIA Federal Awards Manager after the untimely death of Ken Gott, has been forced to resign from the position because of the pressure of a new job.

The WIA thanks Phill for the hard work he has put into the position, and wishes him well in his new job. To those members who have been caught up in a backlog while a new Awards Manager was found, we ask your patience and tolerance.

A new Federal Awards Manager has now been appointed. John Kelleher VK3DP, a keen and experienced DXer and awards hunter has been appointed to the position, and Steve Gregory VK3OT, will assist John by handling claims for DXCC and WAS (VHF) and WAVKCA (VHF).

Both John and Steve expect to have the backlog of awards claims cleared in a very short time.

Stolen Equipment Register

There have been two large thefts of amateur radio equipment in the past two weeks, one in Melbourne, the other in Sydney.

In both cases details have been provided to the WIA and have been entered into the WIA Stolen Equipment register. This register is maintained by the WIA but is available for the benefit of all radio amateurs in Australia.

One small example of the effectiveness of the Stolen Equipment Register occurred early in August. Police in Queensland had recovered, in a drug related raid, an amateur transceiver which had been stolen several months previously. The serial number on the transceiver had been removed but the police telephoned the Executive Office of the WIA to see if we could help identify the rightful owner of the transceiver.

Fortunately the owner had reported the details of the theft to the WIA Stolen Equipment Register. Within seconds we were able to advise the police of the likely owner of the equipment.

The owner contacted the Executive Office a few days later to let us know what had happened and say that, as soon as the court case is finished, he will have his stolen rig returned to him.

If you are unfortunate enough to have amateur radio equipment stolen, please let us know the full details (of course, you have a list put aside of the serial numbers of all your equipment, haven't you?). Also, if you are suspicious that the "red hot" bargain transceiver you are about to buy might be "hot", give the Executive Office staff a call and get them to check if it happens to be on the Stolen Equipment Register.

Packet Radio and IARU Conference

Recent WIANEWS items on WIA contributions to the coming IARU Region III Conference in Bandung next October said packet radio would be the subject of a conference paper. In preparing that paper the WIA has drawn heavily upon information arising from a *"Way Ahead for Packet Radio Symposium"* held in Canberra recently. Incidentally, packet operators from five of the seven Australian states were present at those discussions. A draft of some Bulletin Board System (BBS) operators guidelines, put together at the symposium, was also circulated to prominent BBS operators in all states, to WIA Federal Councillors and to Divisional Technical committees in a bid to obtain inputs. Comments were also invited on band plans, protocols and operating procedures.

The WIA is pleased with the effort some recipients took to respond with well argued views. This has allowed a paper to be drawn up which truly represents the views of Australian packet practitioners out there in the field. The bottom line was, in effect, "steady as she goes" and use commonsense when operating on packet.

The WIA wishes to express its sincere thanks to the following who contributed:-

VKs 1KCM, 2EHQ, 2XY, 3AVE, Canberra Amateur Packet Radio Group, Australian Amateur Packet Radio Association & South Australian Packet Users Group. Grateful thanks are also due to Kevin VK1OK, who drew it all together and drafted the following paper for clearance by Executive.

Packet Radio Regulations and Operations

A paper from the Wireless Institute of Australia for presentation at the eighth IARU Region III Conference, Bandung, October 1991.

Background

The period since the last IARU Region III Conference in 1988 has seen a steady growth in packet radio activity in Australia. This paper covers significant Australian packet radio developments arising since that time.

Band Plans

Australian Packet Radio operation has generally conformed to the Band Plans developed at the last IARU Region III Conference in 1988. The experience of Australian operators is that the data subbands are working well. The reasons for separating packet radio and other data modes are as valid now as when the plans were developed.

The 14 MHz sub-band allocation for data communications has operated well after an initial bedding in period. While this plan is at variance with those of Regions I and II, observations by Australian operators show that packet radio stations from all regions regularly operate in this subband. The frequency of 14.107

MHz is much favoured for both national and international BBS forwarding in all Regions.

With the increasing availability of the 10, 18 and 24 MHz bands, the BBS traffic load has been spread across all available bands, but 14 MHz is still the most reliable band for national and international working. The subband upper limit of 14.112 MHz should be retained.

Protocols and Regulation

Packet Radio development is still very much in the experimental stage, especially in the area of networking. Domestically, Australian packet radio operators have been hampered by overly restrictive identification requirements that have hindered the development of packet radio networks across the country.

The WIA has continued to emphasise the open experimental nature of the mode and in conjunction with the packet community is developing a proposal for submission to DOTC for more relaxed regulatory requirements which will better allow the mode to develop.

Under the framework being developed, the Network becomes an entity in its own right, whose internal traffic and methods of routing are not of consequence to operators accessing the network.

The WIA does not see a need for any restrictions on protocols, an approach which has been borne out over time. Rather, the WIA feels that "standards" will tend to emerge naturally if they are seen by the practitioners of the mode as being useful.

Such "standards" will be adopted until developments require the adoption of a different "standard".

Bulletin Board Systems (BBS)

Bulletin Board Systems continue to play an important role in the packet radio scene. Most BBS Sysops are dedicated, hard working people, providing a service to their fellow packet radio users.

In conjunction with the packet community, the WIA has recently developed a set of guidelines for BBS Sysops. These guidelines which have been widely publicised among the BBS Sysops are not seen as being static, but subject to revision to reflect current procedures and practices.

A copy of these guidelines is attached for the information of member societies.

Summary

Packet Radio continues to develop in Australia under the guidance provided by the IARU Region III Conference in 1988. That guidance is still relevant and no need is seen for change at this time.

Attachment A: Guidelines for packet bulletin board operators.

Service Level

When an individual or group decides to establish a Bulletin Board, its Service Level must also be established and publicised. The Service Level is a description of what services will be provided.

As part of the service definition, the Service Area of the BBS should also be defined. This is a description of what area the BBS will service and would normally define from where the BBS would accept users who use the BBS as its home BBS, and where the BBS would forward to PMS systems if these are supported.

Beaconing

A BBS should beacon regularly only within its service area and the period should not be shorter than one beacon every 30 minutes.

Software

The software to be used is the choice of the BBS operator. If the BBS is to interface to the mail forwarding network, then the software should support, at a minimum, BIDS and Hierarchical forwarding.

Users

Users should be treated courteously. Likewise, Users should treat Sysops courteously. Excluding a user from a BBS should only be done in extreme circumstances.

Mail Forwarding

Where the mail forwarding is conducted on user frequencies, it should be restricted to non-peak times or other times to minimise the intrusion on the normal operation of non BBS traffic. If forwarding takes place on dedicated frequencies, then no restrictions apply.

Message Sizes

Where a message may be routed via HF, the message should be restricted to 3 KBytes in length. For more reliable paths, longer messages may be used, but keeping messages reasonably small is a desirable aim.

Number of Bulletin Boards in an Area

As a general rule of thumb, for a general mail handling Bulletin Board, each operational port can support up to about 200 casual users, with a lesser number of regular users. If there are less than about 25 regular users, then there is probably insufficient justification for another general BBS. In areas with a high number of users, more than 1 BBS may be required.

Special purpose BBS should be considered separately. The Service Level of a special purpose BBS should not overlap to any significant extent with that of an existing general purpose BBS. A separate frequency for a special purpose BBS should be chosen where possible.

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1991 Remembrance Day Opening Address

MAJOR GENERAL B W HOWARD AO MC

I AM MOST PLEASED TO launch the 1991 Remembrance Day Contest for the Wireless Institute of Australia, and I note with interest the most distinguished persons who have done so in the past. While I could not personally compare with many of them, I am only too well aware of the part played by communications in peace and war.

That your Institute is still so active is a tribute to the dedication of so many volunteer operators who maintain their skills at a time when it becomes more difficult and expensive to do so, and I congratulate you all for that.

But why, some may ask, bother to do so when we have been at peace for so long, and there are indications, fortunately, that this state of things will prevail. As one who is totally involved in managing emergencies, the answer is only too obvious. We need you!

When I took up the appointment of Director General of the State Emergency Service of New South Wales, I was disappointed that many of the organisations which had something to contribute were not properly integrated into our emergency management system.

In all but one of the major emergencies which I became personally involved in, including the Newcastle earthquake, which I am sure you will all remember, normal means of communication were lost. I am sure that this is not a new phenomenon. Yet, at that time, not all the emergency services were aware what the volunteers of the Wireless Institute could do. I am working to ensure that all agencies are properly integrated into an emergency management system, and I urge all of you who are listening today to make sure that your capability to assist during an emergency is known by the right people.

So I take the opportunity of your Remembrance Day Contest to ask you to become involved for it does not really matter whether the emergency we face is from an armed enemy or from a natural disaster, the need for communications remains the same.

But, your skills will be wasted if your capacity to provide communications is not known by the emergency services, and used by them as a matter of course.

In conclusion, let us now turn our minds back, and remember those in whose honour this contest is being conducted, and has been for the past 40-odd years. Their efforts contributed in no small way to the good things of life we have today.

In particular, our freedom, for which we should be everlastingly grateful, and mindful of the fact that, without them, we might not have it at all. Thank you all very much for allowing me to share in your Remembrance Day Contest, and my best wishes to you all.

I now have pleasure in inviting all those listening to take part in the 1991 Wireless Institute of Australia Remembrance Day Contest.

ar

Major General B W Howard, AO, MC
Director General, State Emergency Service

Major General Brian William Howard was born in Sydney on 23 March 1938, and educated at St Pius X College, Chatswood. Graduating from the Royal Military College, Duntroon, in December 1959, he served in regimental appointments in both 3rd Battalion, the Royal Australian Regiment and the Pacific Islands Regiment before being posted on exchange duties with the 3rd United States Marine Division Okinawa and South East Asia in December, 1963.

He served as an instructor at the Royal Military College, Duntroon, from 1965 to 1967 before returning to 3rd Battalion, the Royal Australian Regiment as a Company Commander, in October 1967. He served with the Battalion in South Vietnam in 1967/68 and was awarded the Military Cross during that service.

In 1969, Major General Howard was posted to the 1st Battalion, Pacific Islands Regiment, as a Company Commander. He returned to Australia in early 1972, before attending the Canadian Staff college in 1972/73. He assumed duties as a Staff Officer in Operations Branch, Army Office in 1973, and later as a Staff Officer in the Directorate of Infantry.

In January 1976 he assumed command of 3rd Battalion, the Royal Australian Regiment, and remained in that posting until attending the Joint Service Staff College in 1978. In September 1978 he was posted as an Exchange Instructor to the United Kingdom Staff College at Camberley. This posting is a significant achievement for any officer and is highly sought after. He was admitted into the Order of Australia in January 1979 as a member, in recognition of his service as Commanding Officer of 3rd Battalion, the Royal Australian Regiment. He returned to Australia in late 1980 and was posted as a Senior Staff Officer in the Directorate of Operations and Plans (Army Office).

He assumed the appointment of Director of Infantry and Regimental Colonel of the Royal Australian Regiment on promotion to Colonel in April 1981.

In May 1983 he was promoted to Brigadier when he assumed command of the 6th Brigade in Brisbane. On completion he was appointed as Director General Operations and Plans. He was promoted to Major General on 27 January 1987, and appointed as Director General, Natural Disasters Organisation, on 27 February 1987.

In May 1987 he was appointed by the United Nations Disaster Relief Co-ordinator (UNDRO) to an international panel of disaster management experts, which meets annually in Geneva to select the recipient of the SASAKAWA-UNDRO Disaster Prevention award. In 1988 he made official visits to the United States Federal Emergency Management Agency, Emergency Preparedness Canada and New Zealand Civil Defence. In April 1989 he was appointed by the Prime Minister to co-ordinate Australia's contribution to the International Decade for Natural Disaster Reduction.

Major General Howard was appointed Director General of the New South Wales State Emergency Service on 18 December 1989.

Major General Howard and his wife Carmen (nee Mills) were married in 1966 and have two children. **ar**

WIA Exam Service

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445
BLACKBURN 3130

THIS MONTH I AM TAKING a slightly higher profile than my notes usually do. I want to discuss the changes in the examination system, and that is something that concerns all amateurs, not just the ones with an interest in education.

Bill Roper, VK3ARZ, announced last month in WIA News and on the Federal Tapes, that arrangements have been made for the Federal Office of the WIA to assume the responsibility for producing and providing examination materials to all who require them throughout Australia. Perhaps a little of the history is in order.

Many readers will remember that there were lengthy discussions in 1987-8 about DoTC's proposals for the devolvement of amateur examinations, on the grounds that the costs of the examinations were out of proportion to the sums recovered from candidates. The WIA agreed that for DoTC to attempt to cover costs by raising the examination fees was not a good idea, and was likely to result in excessive charges to candidates. After deliberations and wide discussion, the WIA position was elaborated in a submission to DoTC which stated that the preferred options, as seen by the WIA were, in order of preference, firstly, for DoTC to continue to administer the examinations; secondly, for DoTC to provide prepared materials for the WIA to administer; and, as third preference, for the WIA to administer the whole examination system for all of Australia. (This third system had been proposed to the WIA by DoTC in 1984,and discussed at Executive and Joint Meeting level. However, negotiations had lapsed when the DoTC Central Office was moved to Canberra in 1985). In all dealings, the main consideration of the WIA, and a large number of other bodies which provided comment, was that the standard of the examinations should not be lowered.

The system of devolvement which finally emerged, with the wide release of the question banks and the vast number of examiners, was not at any stage considered, proposed or approved by the WIA. Nevertheless, several WIA divisions, clubs and a number of individuals took up the challenge and worked within the DoTC framework to make examinations available to most of those who required them. Some of these examiners have done an excellent job, and deserve the thanks of all amateurs for the time and effort contributed.

I do not need to tell those who have been preparing examination materials that the system rapidly became cumbersome and frustrating. As with most other government departments, DoTC suffered curtailment of resources, and the Amateur Service, one of its smallest areas of responsibility, was requiring more and more time for accreditation of materials. So it was not surprising that further changes began to be considered.

The WIA is in continual contact with DoTC on a wide range of topics affecting the Amateur Service. When it became apparent that a further change to the examination system was impending, and that one of the possible changes was to an even wider range of examiners with less control by DoTC, discussion commenced on the possibility of the WIA assuming the responsibility for the administration of the whole examination scheme.

Extensive negotiations over a fairly tight time schedule resulted in the WIA Executive agreeing to accept the responsibility of preparing and providing examination materials and results information for all Australian candidates. The terms and conditions of the agreement were finalised in mid-July.

This extra task will add considerably to the workload of the Executive Office, which will be responsible for managing the system. But it relieves the individual examiners of the load of preparing examination materials and having them accredited. Instead, they will be supplied with the required examination elements ready for use within a few days of a request being received. It also means that there will be one uniform standard for materials throughout Australia, and so equal opportunity for all candidates.

The role of the local examiners, however, remains as important as ever. They are the people who have direct contact with the candidates, and who therefore have considerable influence over how the candidates perceive the examination process and amateur radio in general. They will be responsible for the security of the materials, arranging the time, venue and comfort of the examination session, checking candidate identity and providing a preliminary pass/fail assessment. If they wish, they may also provide failed candidates with a report on the reasons for failure. (Arrangements will also be made for supply of a paper evaluation from the office if the examiner cannot supply it).

Because of the advice available from current experienced examiners, it has probably been easier to plan a revised system than it would have been to organise it completely from scratch if the original WIA third option had been accepted. The aim throughout has been to ensure that candidates are in no way disadvantaged by the new system. As far as possible, the new protocol has built on the strengths of the original devolved system and, hopefully, avoided most of the pitfalls. So, since many examiners were notifying candidates of their results on the same day as the exam, provision has been made for examiners to mark papers and provide provisional pass/fail results immediately after the examination. Because of the agreement with DoTC, results must be confirmed from the Executive Office on a form which will be the basis for the issue of the Certificate of Proficiency and, subsequently, the licence.

The cost of examinations has always been a sensitive issue. Many readers will remember the outcry when DoTC raised its examination fees from the time-honoured $2.00 to a more realistic figure. The WIA is aware that many dedicated amateurs have been providing examinations at minimal cost by virtue of considerable volunteer effort (and perhaps by the use of the boss's photocopier). This has been great for the candidates, but unfortunately the WIA does not have a continuing committed supply of free volunteer labour, or "free" photocopying. Members must be assured that the examination section will not be subsidised out of members' subscriptions, and will not be a drain on the financial resources of either the Federal body or the Divisions. It was therefore decided that the examination section should be run as a separate entity, with a separate budget, on a cost-recovery basis. Estimates based on expected candidate numbers and on pro-

jected costs per candidate are that the charges for each examination element will be set only slightly above the figures that were being charged by DoTC before devolvement, and will remain at that figure for at least a year.

So how does it all happen? The proposed system was outlined in WIANEWS last month. Letters have gone from the WIA to all current examiners, whether WIA or not, explaining the changes and inviting them to continue as examiners in the new system. If there are any current examiners who have not received this letter from the WIA, please let the Executive Office know at once of your existence, so your name can be included in future information releases. The names were taken from a list supplied by DoTC, but it is known that there were some omissions. "WIA Exam Service" at the Executive Office will begin to accept applications for accreditation as examiners very shortly, and it is intended that examination materials will be available as from 1 October. Enquiries about the administration of the examinations should go to the General Manager, WIA Executive Office. Further details will appear in WIANEWS and in letters to examiners as necessary.

I will not be involved in the examination administration, or the preparation or supply of materials or results. As Education Co-ordinator, however, I will still be taking an active part in the work of extending the question banks and revision of the syllabuses which I mentioned last month. I offer the new system my wholehearted support, and am convinced that it has the potential to provide at last all those benefits we sought so actively over the years. It promises easy access, negotiable time and location, equality of opportunity and a maintained standard while still being under the control of the Amateur Service. I am very pleased that the changes have at last gone this way, and look forward to watching "WIA Exam Service" develop and grow.

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The Merits of Open Wire Lines

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Introduction

IN CHOOSING A FEEDER SYSTEM for antennas, preference is often give to the use of 50-ohm coaxial cable. This practice is often applied when, in fact, it might be more efficient, or even more convenient, to use balanced open wire lines. This article is devoted to pointing out the advantages of open wire lines and discussing a few particular applications where they might be the preferred choice to feed the antenna.

Coaxial Cable

Before turning to our open wire line discussion, we should first discuss the merits of coaxial cable, in particular the type with polythene dielectric as generally used in amateur radio. Typical values of characteristic impedance for this type of cable are 50 ohms and 75 ohms, very suitable values to match the radiation resistance of many basic antennas. Because of the concentric form of the two cable conductors, the coaxial cable fields are confined to within the inside of the cable bounded by the outer conductor. As there is little field on the outside of the outer conductor, the cable can be mounted directly on a metal support. Owing to this feature and also the flexible nature of the polythene dielectric, the cable is very suitable for running up the side of a metal tower or mast to the antenna on top. Furthermore, radiation directly from the cable is minimised because of the confined field. From a receiving point of view, the cable forms a transmission line which is shielded from direct signal pick-up. This is an advantage if the cable must run through a high level field of localised noise.

Attenuation

Figure 1, reproduced from the *ARRL Antenna Handbook,* compares the attenuation of various types of transmission line. Coaxial cable type RG8 is commonly used to feed an antenna on a rigid structure such as a tower. From the curves, RG8 has an attenuation of 0.8dB per 100ft at 14MHz and 1.2dB per 100ft at 29MHz. This is clearly a very satisfactory cable for HF work but, being a 0.4-inch diameter cable, it is somewhat bulky to hang in free space from the average amateur wire antenna For the wire antenna, we might choose a lighter 0.2-inch

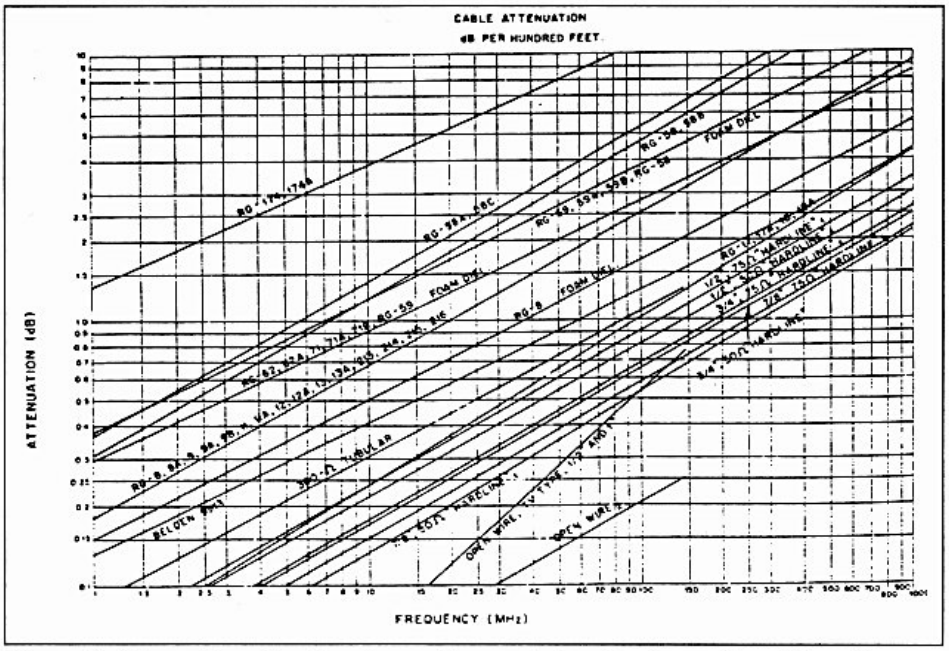

Figure 1. Attenuation of various types of transmission line (reproduced from the ARRL Antenna Handbook).

diameter cable. Suppose we were to feed a dipole antenna set at a height of half a wavelength above the ground. The radiation resistance at this height could be assumed to be 73 ohms and a 75 ohm 0.2-inch cable, such as RG59, could be used to match the antenna through a 1:1 balun transformer at the antenna centre. Referring again to the curves, this cable (RG59) has an attenuation of 1.5dB per 100ft at 14MHz and 2dB per 100ft at 28MHz.

All the attenuation figures we have quoted assume a standing wave ratio (SWR) of 1:1. We now refer to figure 2 which allows us to derive the attenuation for SWR greater than 1:1. If our SWR is 3:1, we see that the attenuation of the RG59 cable has increased to 2dB/100ft at 14MHz and 2.8dB/100ft at 28MHz, quite an appreciable loss. Instead of using RG8, we could use 300 ohm open wire TV line via a 4:1 impedance ratio balun transformer. This cable is quite light and flexible, and hangs very well from a wire antenna From figure 1, its attenuation for an SWR of 1:1 is around 0.08dB/100ft at 14MHz and 0.17dB/100ft at 28MHz. We again refer to figure 2 and it becomes clear that, for an SWR of 3.1, attenuation of the open wire line is still only a fraction of a dB/100ft at both frequencies and, hence, far more efficient than the coaxial RG59 cable.

Tuned Feeders

The operation of wire antennas multi-band is often made a lot easier if the transmission line can be tuned. This of course implies a very high SWR. Suppose we select a value of SWR = 20, the highest value shown on the curves of figure 2. For this SWR, our RG59 coaxial cable has an attenuation of 6dB/100ft at 14MHz and 7.5dB/100ft at 28MHz. This is excessive attenuation and hence the coax cable is hardly suitable for operation in a tuned feeder mode.

We now apply the SWR = 20 to the open wire TV cable and we get attenuation figures of around 0.8dB/100ft at 14MHz and J.4dB/100ft at 28MHz. Quite clearly, open wire line is essential for good power efficiency when using tuned feeders.

Some Typical Wire Antennas

One of the most popular of multi-band wire antennas is the G5RV. A typical form of this antenna makes use of a 75 ohm twin lead or coaxial cable coupled via a matching stub of 300 ohm ribbon (refer figure 3). Whilst a good SWR is

achieved at 14MHz, it is reported to be as high as 6:1 at 7MHz and 21MHz and 4:1 at 28MHz (refer VK3AVO, *AR* April 1974 and December 1982). The alternative arrangement is to use 83ft of open wire line all the way to the centre of the antenna. Using this type of feed system, the attenuation is negligible for whatever SWR applies and, hence, it is the preferred system.

Considerable attention has recently been given in "Random Radiators" to various forms of the series fed or "Carolina" Windom antenna. A typical form of this antenna is shown in figure 4. An antenna impedance of around 200 to 300 ohms is assumed and this is coupled via a 4:1 or 6:1 impedance ratio balun transformer at the antenna connecting point. Of course, the balun transformer must be fitted in some sort of weatherproofing housing attached to the antenna in space Would it not be better to feed the antenna with 300 ohm TV open wire line (or similar) and fit the balun transformer in the radio shack? Not only would the transmission line have lower power loss, but a weatherproof fitting for the transformer would no longer be required

End Fed Horizontal Antennas

If the radio shack is nearer to one end of the wire antenna than its centre, it is often more convenient to end feed the antenna with a shorter length of feed line. The end of the antenna is a high impedance in the order of thousands of ohms, the actual value being dependent on the wire size and the number of half wavelengths along the wire. One method of matching this impedance to the lower impedance of a balanced transmission line is to tap in the line connection at the appropriate point on a quarter wave matching stub. (See figure 5). This is an efficient feed system but it is limited to single band operation.

For multi -band operation of the end fed antenna, the open wire line is fed directly to the antenna end and operated In a tuned mode. The transmitter is interfaced with the line via a tuner with balanced output (refer figure 6). The end fed antenna has some different characteristics to its centre fed counterpart. At a frequency for which the antenna is one half wavelength long, the radiation pattern is similar. However, this is not so at higher multiples of a half wavelength. Take the case of the second harmonic operation in which the wire is one wavelength long. For the centre fed antenna, the two half waves are in phase, but for the end fed antenna, they are out of phase. The centre fed antenna concentrates its field in a bi-directional pattern whereas the end fed antenna has four main lobes giving a more omni-directional pattern.

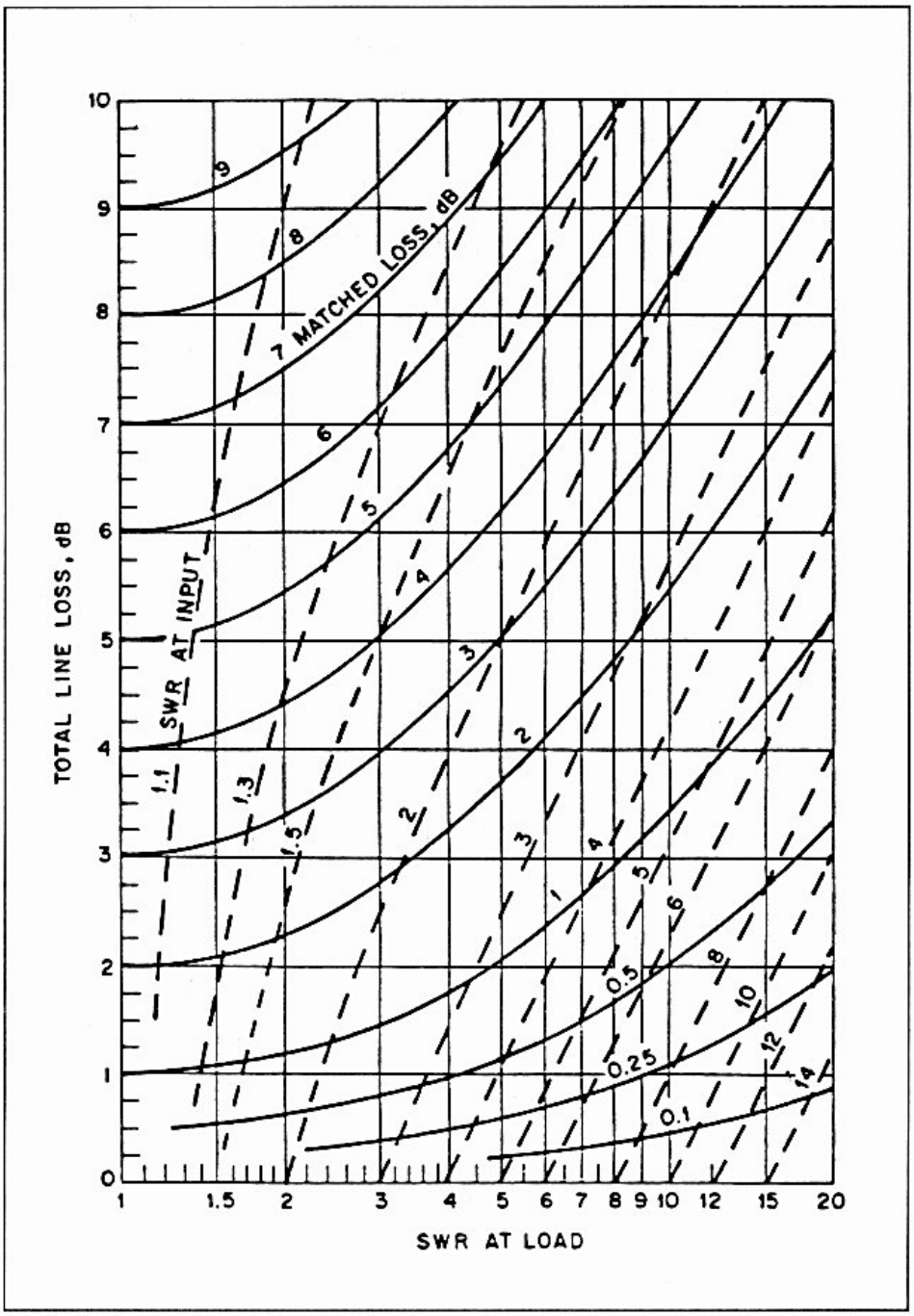

Figure 2. Curves show increased attenuation in a transmission line when the SWR is increased (reproduced from the ARRL Antenna Handbook).

An interesting version of the end fed antenna is the end fed inverted V. Assuming this is cut for a half wavelength on 40 metres, it operates similarly to the centre fed inverted V on that band. On 20 metres, there are two half-wave sections as in the horizontal wire but the fields are around 90 degrees to each other (assuming a 90 degree V). In the horizontal plane, the fields are out of phase, but in the vertical plane, they are in phase and additive. It seems reasonable to assume that, on 20 metres, this antenna operates more like a vertical antenna with two broadside elements and a consequent low angle of radiation. The antenna can also be operated as three half waves on 15 metres and four half waves on 10 metres with even more complex radiation patterns. Such an antenna system has been described by Colin Dickman in "Radio ZS" as the "ZS6U Minishack Special". The articles concerned were also reprinted In *QST* and *Amateur Radio*.

The end fed inverted V has been used as a multi-band antenna at the writer's

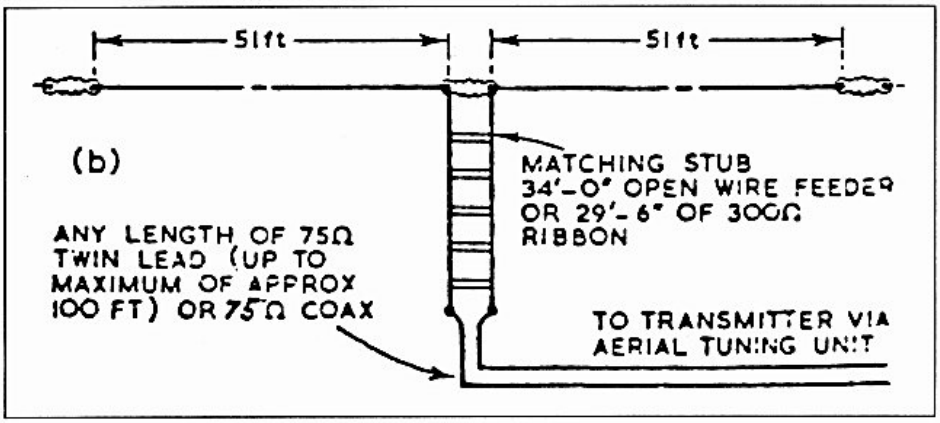

Figure 3. The G5RV antenna with 75 ohm transmission line.

home for many years and with considerable success. In this case on 20 metres, the open wire line is matched to the end of the antenna using the quarter wave matching stub. The shorting clip for the stub is just outside the radio shack door and on 40, 15 and 10 metres, the short is removed and the twin open wire line and part of the stub all become the tuned line used on these bands. On 80 metres, the feeder wires are paralleled and the antenna plus feeder and stub become a Marconi antenna operated against ground radials. On this band the radiator is a little over a quarter wave long.

Lengths of Tuned Lines

Tuned lines can be any length provided the antenna tuning system can cope with the impedance reflected down the line. Taking the example of the end fed antenna, odd multiples of a quarter wave will reflect very low impedance and even multiples very high impedance. Both these extreme conditions might present difficulties for the antenna tuning unit and line lengths which are multiples of a quarter wave should perhaps be avoided.

Open Wire Line at VHF

Most custom built VHF antennas are made to match directly into a 50 ohm coaxial cable and, generally speaking, feeding the antenna via a coaxial cable is the most convenient thing to do. Commonly used types of 50 ohm coaxial cable are RG58 and RG8. On two metres, RG58 has an attenuation factor of 4.5dB/100ft and RG8 has a factor of 3dB/100ft. If the transmission line is long, one might well consider open wire line as an alternative to the coax cable. The 300 ohm TV open wire line has an attenuation factor on two metres of only 0.75dB/100ft.

An antenna in common use is the 10-element channel 5A TV Yagi which has been modified for 2m operation. The active element in this antenna is a folded dipole which presents a terminal impedance of around 300 ohms, specifically designed for 300 ohm ribbon cable or 300 ohm open wire line. Here is a case where the 300 ohm line can be run all the way to the antenna from the radio shack with lower loss than using the coaxial cable. At the transmitter end, a 75-300 ohm coaxial balun (as shown in figure 7) can be used to interface with the transmitter The 75 ohm load to the transmitter might be a little high for the usual 50 ohm-output but in practice it can work quite well

Another antenna which is easily matched to the open wire line is the J antenna, figure 8. A half wave vertical radiator is connected at its lower end to a quarter wave matching stub. The open wire line is simply connected to the stub at an impedance point matching the line impedance. The position of the connecting taps can be set by experiment for minimum SWR on the transmission line

For a horizontal half wave VHF antenna, one might choose to couple from the open wire line via a delta match as shown in figure 9. This is also a common method of coupling to a HF wire dipole, which is operated only on its fundamental frequency.

Whilst the open wire TV line provides an ideal low-loss feed system, there is one disadvantage When it rains, globules of water collect on the bridges which spread the wires and this changes the characteristics of the line. On HF, the water appears to have little effect but, on VHF, the SWR increases quite dramatically. When the rain stops, the water globules can can be shaken from the line with a blow from a broom handle or similar

Once this is done, the SWR returns to normal.

Procurement & Construction

We have given considerable attention

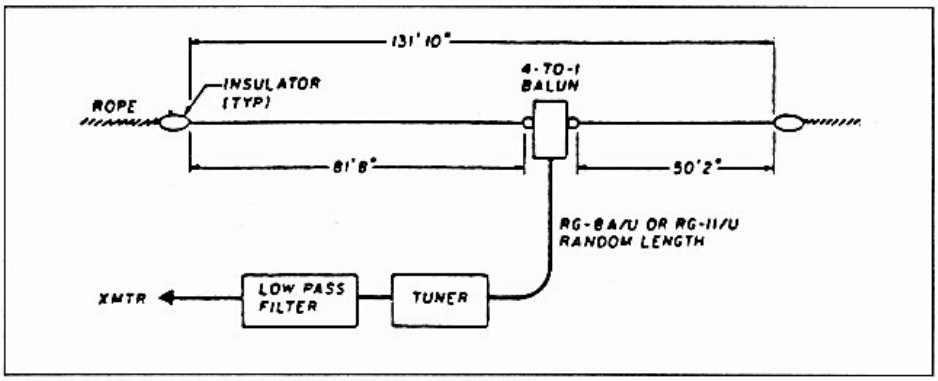

Figure 4. The Carolina series fed Windom antenna using coaxial transmission line.

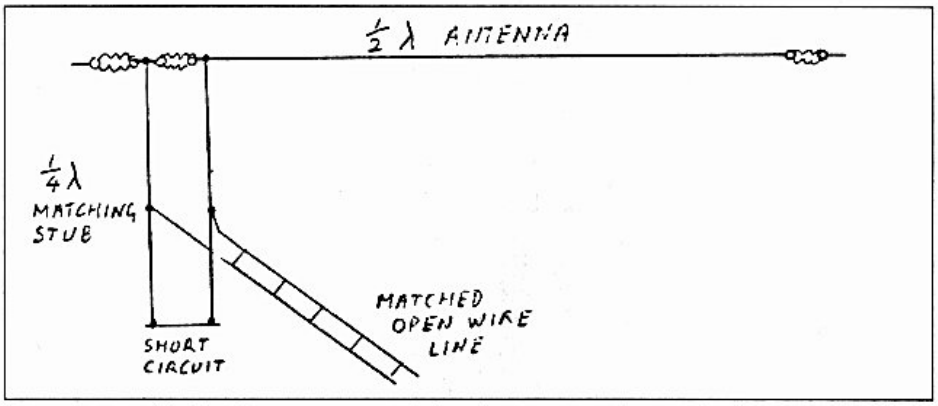

Figure 5. End fed half-wave antenna fed with open wire line and matched using a quarter-wave stub.

to the 300 ohm open wire TV line. This line or cable is made up of two insulated 18SWG single strand conductors spaced one half inch (12.7mm) apart. Insulating spacers are moulded around the conductors at intervals of around 12 to 15 cm along the cable. The cable is light and flexible and ideal to hang in space supported at one end by the wire antenna. In the past, the cable has been available from outlets which handle TV antenna components and installation, but of recent years, the supply has dried up. If anyone has information concerning whether it is still available (perhaps from overseas) we would be interested to be informed. Perhaps procurement could be taken up by one of our electronic component suppliers.

Failing supply of a ready made cable, open wire line can be easily constructed. Almost any type of copper wire of fairly heavy gauge (at least 1mm diameter) will do the job. Single-core wire, rather than stranded wire, makes a more rigid job to keep the two wires parallel. For a given characteristic impedance, the wire spacing depends on the wire gauge used. The relationship between wire spacing, wire diameter and characteristic impedance is as follows:

Impedance Zo = 276 log (2S/d) ohms

where S = Centre to centre distance between conductors

and d = Diameter of conductor (Same units as S)

With insulating spacers fitted, the actual impedance will be somewhat lower than that calculated from the formula. Spacers, as shown in figure 10, can be made up from any suitable low loss insulating material.

If the line is to be used in a tuned mode, the characteristic impedance is not really important and the line dimensions can be set to whatever is suitable for construction. The greatest losses in the tuned line occur at current anti-nodes due to RF resistance of the conductors and at voltage anti-nodes due to shunt resistance loss across the spacers. Whilst the TV line produces quite low losses, they can be reduced even further by making a link with a heavier wire gauge and increasing the spacing between the conductors.

Fields

If the open wire line is perfectly balanced, the fields around the two conductors are equal and opposite and hence radiation from the line is essentially cancelled. However, as the the wires are a finite distance apart, there must be a small differential field created which might be detectable close to the line. If installed close to say a microphone lead within the radio shack, the differential field might be sufficient to cause RF feedback, more so than coaxial cable with its confined field. One way to reduce the differential field is to twist or barrel roll the cable so that over a distance the differential effect is cancelled.

As the fields from the open wire line are not confined, the line must be spaced

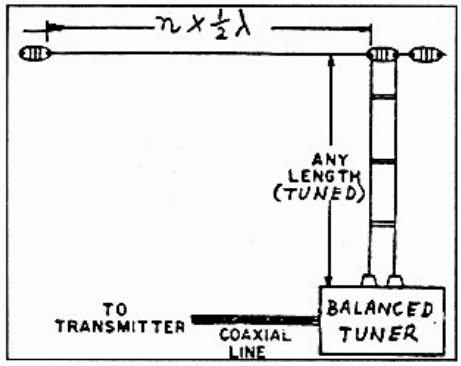

Figure 6. End fed (Zepp) antenna for multi-band operation uses tuned feeders.

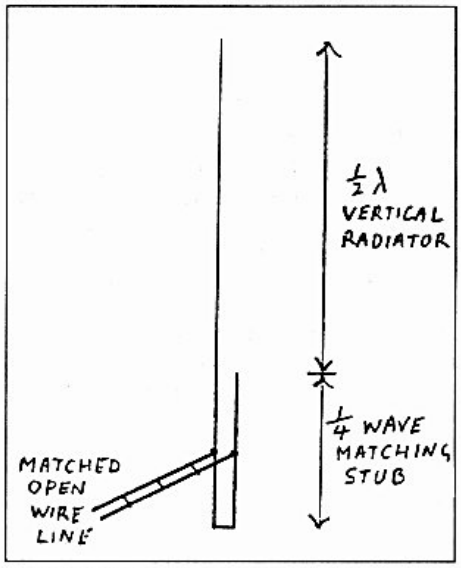

Figure 8. The "J" antenna with matching for open wire or other balanced lines.

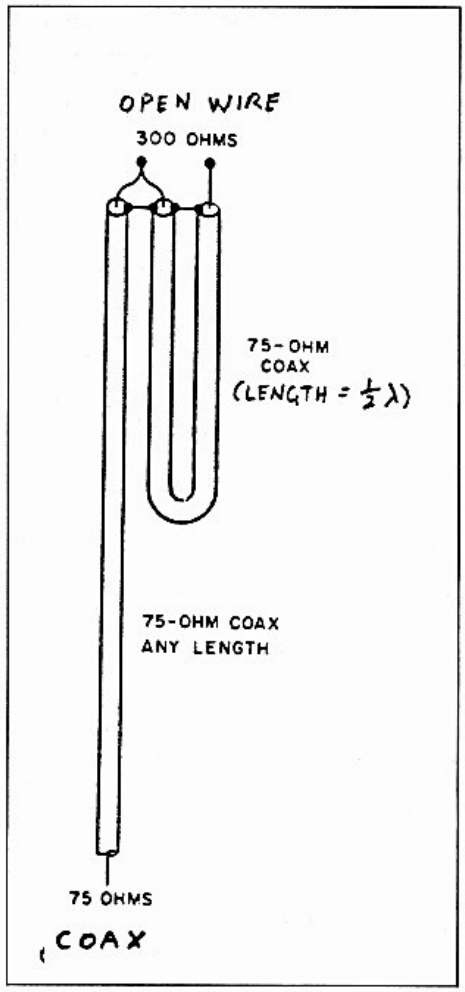

Figure 7. Coaxial cable balun - 75 ohm coax to 300 ohm open wire (reproduced from the ARRL Antenna Handbook).

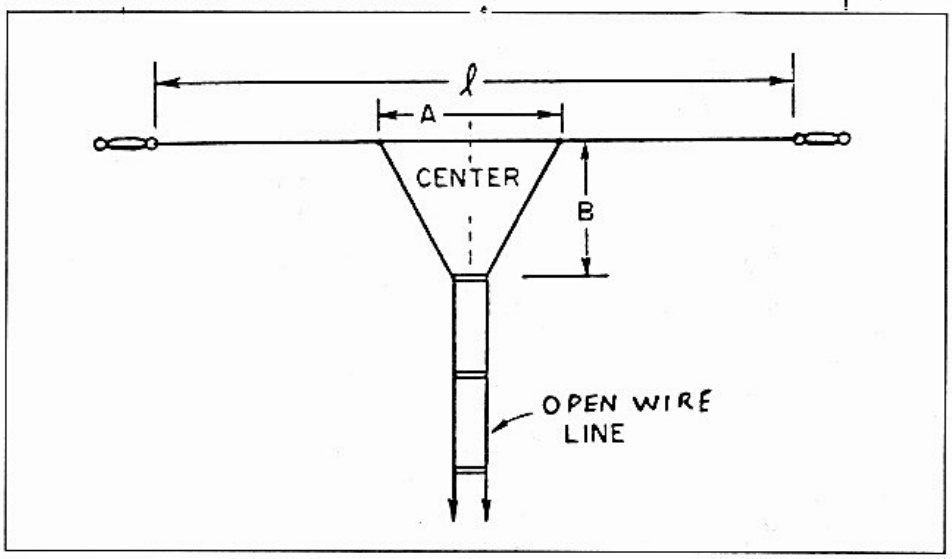

Figure 9. Delta match for balanced line.

out from any metal structure, such as a steel tower, to prevent the characteristics of the line becoming compromised. This does not prevent the line being used at such an installation but it is usually easier to use low loss coaxial cable which can be clamped directly against the metal sections of the tower.

Connecting to the Transmitter

Most transceivers are designed for a resistive RF output load of 50 ohms. A 2:1 turns ratio balun transformer can be used to reflect 75 ohms from a 300 ohm balanced line which is properly matched. A transmitter with a valve output stage and adjustable loading control can usually accommodate the 75 ohms. A transmitter with a solid state output stage is likely to be more critical and require a more precise 50 ohm load. For the 300 ohm line, this calls for a 2.45:1 turns ratio transformer, a little more difficult to achieve using the normal multi-filar winding technique on a toroidal core.

For tuned open wire lines or those with a high SWR, some form of balanced matching device is needed to interface with the transmitter. At HF, the Z match tuner has proved to be very useful for this purpose. Where a low loss transmission line is used, the main reason for adjusting to give a low SWR facing the transmitter is to present the correct load impedance to the transmitter This particularly applies to solid state output stages which are designed to protect themselves and shut down if not correctly loaded. If the transmission line has low loss, standing waves on the transmission line are of little consequence. Reflected power is not all just lost as some writers have often indicated When there are standing waves the feeder line becomes part of a resonant circuit and in a low loss line, most of the reflected power is returned to the circuit. If the SWR is 1:1 at the transmitter output, power not consumed by the antenna can only be dissipated in the loss resistance of the transmission line and in the RF resistance of the tuning and coupling components.

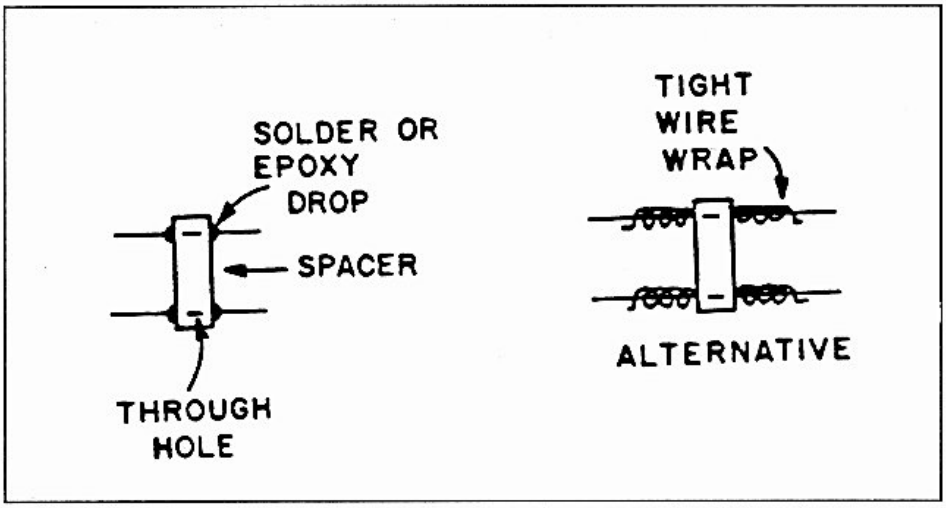

Figure 10. Insulating spacers fitted to open wire line. (reproduced from the ARRL Antenna Handbook).

Summary

Whilst heavy duty coaxial cable seems the best choice of RF transmission line to run up a solid metal structure, such as a steel tower, open wire line is often a better choice for wire antennas, particularly those functioning in multi-band operation. Because of its low transmission loss, the open wire line can be efficiently used on the high frequency bands with a high standing wave ratio or in a fully tuned mode.

A number of typical applications in the use of open wire line have been presented Particular attention has been given to the 300 ohm TV open wire line which is an excellent product for amateur radio use, if it can be obtained. Apart from its application in feeding HF antennas, it is also a good low loss line for VHF applications. (Of course it was designed for VHF TV.)

References

1. ARRL Antenna Handbook
2. Varney - The G5RV Antenna - *Amateur Radio* Dec 1982 (Reprint) **ar**

QRP Classics

EDITED BY BOB SCHETGEN KU7G
SUPPLIED BY STEWART ELECTRONICS $24.00

A collection of the best QRP projects from QST and the ARRL handbook.

The book consists of the following nine chapters.

Introduction.
Construction practices.
Receivers.
Transmitters.
Transceivers.
Antennas.
Accessories.
Power Supplies.
Design Hints.

The articles have been collected over the past 15 years and cover projects which could be built in one hour by a beginner through to more complicated projects for the more advanced constructor. Frequencies covered are 3.5MHz through to 50MHz. Receiver designs featured are from the simple direct conversion design to the more sensitive superhetrodyne.

One very interesting chapter is devoted to the construction of mini circuit modules constructed on 16 pin DIL headers. These modules include an audio amplifier with up to 40 dB of gain, a double balanced mixer, balanced modulator or product detector, and a crystal oscillator which can be used for fixed frequency operation or as an injection oscillator in dual conversion circuits. The final module is a Colpitts oscillator with varicap tuning. Using just four of these modules it is possible to construct a forty metre receiver.

It is important to note that not all the projects in the transmitter sections are for CW but cover SSB as well.

All aspects of QRP are well covered including efficient antennas and test equipment such as QRP directional wattmeter, SWR bridges, field strength meters, transmatches, frequency reference sources etc.

This is a most informative book written in the usual ARRL style and has something of interest for everybody. Reviewed By Bob Tait VK3ERG & Norm Eyres VK3ZEP.

Tower Height Adjuster

JOHN VOGEL VK6BA
6 BRAND STREET
CLOVERDALE WA 6105

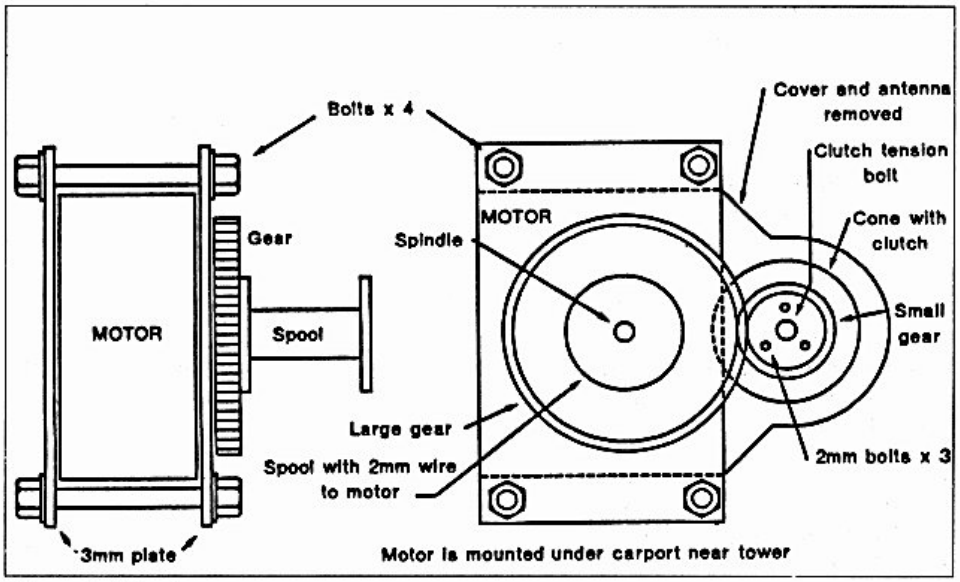

Figure 1. Winch.

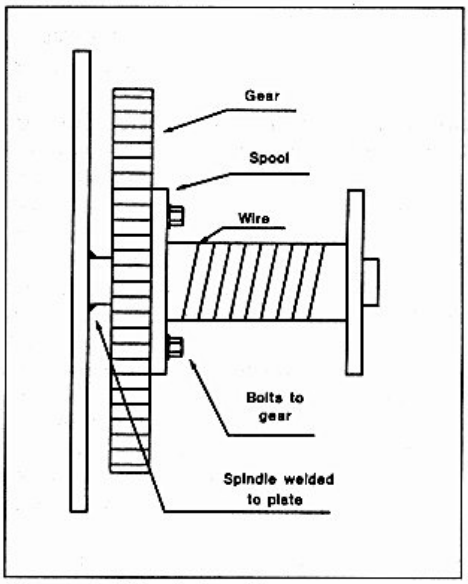

Figure 2. Winch Detail.

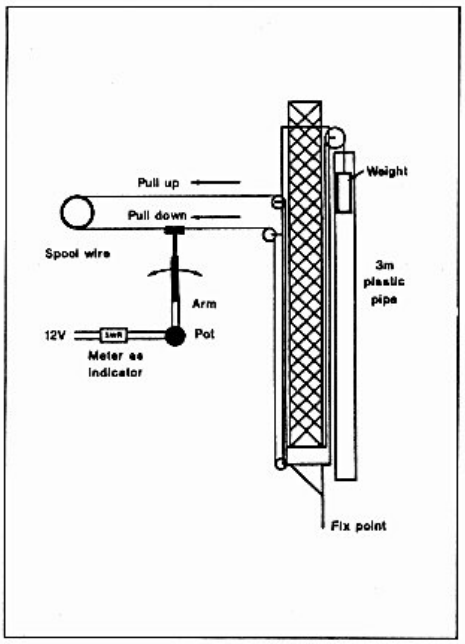

Figure 3. Winch and Position Indicator.

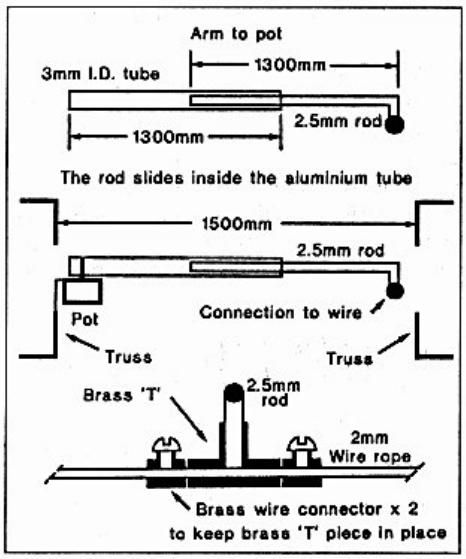

Figure 4. Position Indicator Arm; Position Indicator Arm Mounting; Connection of Position indicator to Winch Cable. The brass "T" swivels on the wire to compensate for height differences. The brass connectors drive it lengthwise.

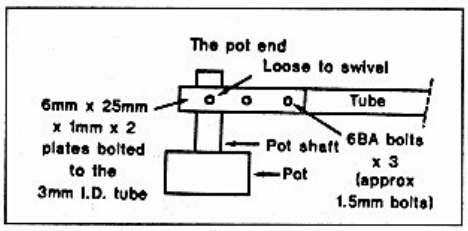

Figure 5. Connection of Position Indicator Arm to Pot.

WHILE EXPERIMENTING with a 2m antenna I needed to adjust antenna height frequently. Winding the telescopic tower up and down was fairly hard work. So I devised a counterweight set-up to make the job easier. To make it even easier, I also devised a motor and remote height indicator.

I put a pulley at the top of the fixed section and ran a steel cable through it to the bottom of the section to be lifted. On the other end of the cable I tied a length of two-inch water pipe which I filled with lead pellets to act as a counterweight. Lead pellets are convenient to use, and permit adjustment of the counterweight.

The counterweight was made a little heavier than the tower section so that the tower section would normally be raised. To lower the tower section I could pull on another wire rope attached to the bottom of the tower section.

To stop the counterweight blowing in the wind, a 100mm diameter plastic pipe was attached to the side of the tower for the counterweight to move inside. This allows the counterweight vertical movement and shields it from the wind.

A safety catch was added to the tower to prevent collapse in case the wire to the counterweight broke.

A winch and indicator were added so that height could be controlled from within the shack. The winch was made from an old electric car aerial and the indicator from a potentiometer and a meter from an old SWR bridge.

The winch is made from an old all-metal electric car aerial by stripping the

Continued on Page 17

The Three Coil Trick

ROBERT MCGREGOR VK3XS
2 WILTSHIRE DRIVE
SOMERVILLE 3912

A 10-WATT CW MONOBAND HF rig can provide fun and surprises on a trip away from the shack, but the only antenna that will fit into a briefcase is a roll of wire, some insulating cord, an earth lead with a battery clip and a small G clamp.

With the aerial wire strung up – or dropped out of the window – clip the earth lead to the water tap of the hand basin. Now we need to assemble the other two components needed to adjust the antenna impedance to the correct resistive load for the transmitter. Reactance correction is performed by either a series inductance or capacitance and the resistance value must be "transformed" to the correct value to load the transmitter (around 50 ohms). The smallest, lightest and cheapest way to approximate this value is by using a three-coil toroidal transformer.

Suitable toroidal cores are available (including data sheets) from Amidon. *(See trade Hamads in Amateur Radio - Ed).* Work out from the tables the number of turns required for 75 ohms and calculate the length of wire needed. Add 200mm to this figure for leads. Put a layer of insulating tape on the core. Cut three wires to the length calculated above. Bare and tin one at each end, just bare the end of the second and leave the third as it is. Using this method to identify each winding avoids the problem of labels dropping off as you twist the wires. Align (straighten) each wire before twisting the bundle by putting one end in a vice and gently pulling the other. A stretch of 2-3mm is sufficient. Now twist the three together without any overlaps and tape each end. Thread the bundle through the core, spacing the turns evenly around the toroid. Tape the windings securely for 100mm from each end. Terminate the windings along a piece of RF insulating material - a piece of perspex with six holes works fine. Now connect your coils series-aiding and it is ready for use. The value of 75 ohms was nominated as the transformer impedance as it will then accommodate 50-75 ohm rigs, and has applications for dipoles, single or two-wire antennas.

It is unlikely that you will exceed the range of values you can match using an end-fed wire antenna. Earth resistance and the series resistance of a tuning coil or capacitor will limit the lowest value that you may require. Should you have difficulty in matching an antenna, a modest reduction in its length will allow you to obtain a match. In this situation the antenna length is arbitrary and can always be adjusted to suit the resistive and reactive values that you have available. Remember to test it all before you go, as it is easier to make modifications at home.

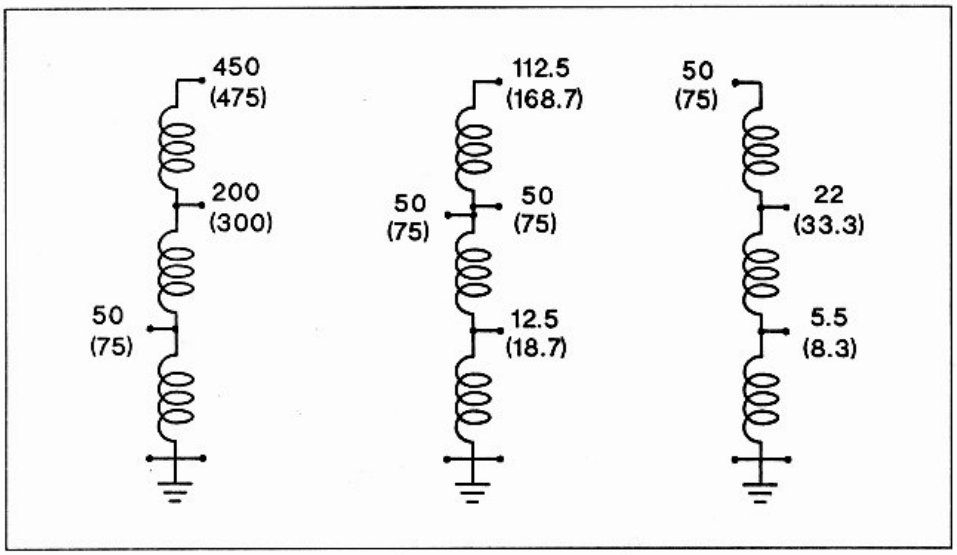

Figure 1. Possible Impedance Combinations (Autotransformers).

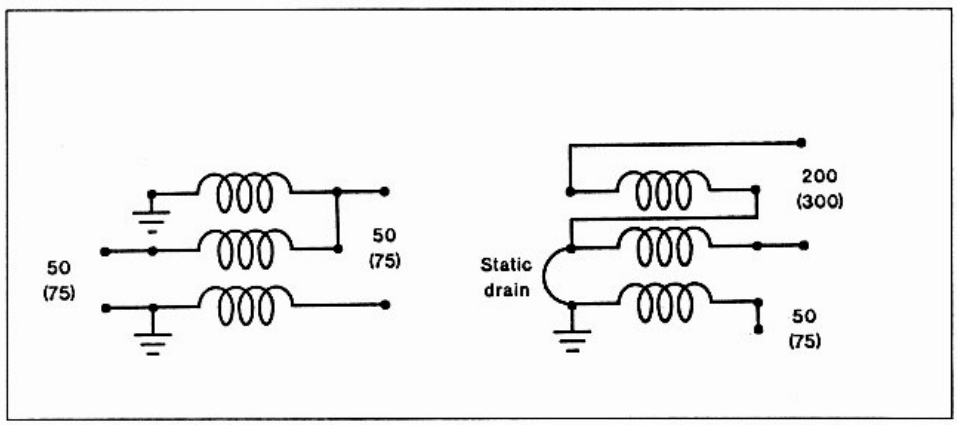

Figure 2. Balun Connections.

Better efficiency is obtained by using between $^1/_4$ and $^5/_{16}$ of a wavelength of wire for the antenna, as this is then tuned with a series capacitor. A two-gang broadcast band unit is suitable. Mount it with the frame insulated and the control shaft extended with an insulated rod through a small earthed metal plate. This reduces "hand capacity" effects and RF burns.

Depending on the antenna length, in wavelengths, you can connect the capacitor in two different ways. For maximum capacity, parallel the stators for one connection and use the rotor as the other. Longish antennas require less capacity to tune, but there is more voltage across the capacitor, so it is best to use one stator as one terminal, the other stator as the second terminal and leave the rotor floating. By adjusting the aerial length for 50 to 100 ohms resistive component, the earth losses are reduced to around 1dB.

With minor variations in the connections used, two additional transformer modes are available (see diagram for more information). Can you do without one in your shack? Have a go.

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Propagation of Long Radio Waves

PART 4 CONCLUSION
(CONTINUED FROM AUGUST ISSUE)

JOHN ADCOCK VK3ACA 12 ALBERT ST., OAK PARK, 3046

Horizontal Polarisation

IN THE PRECEDING TEXT IT WAS stated that with an LF signal there is no horizontal polarisation present perpendicular to the direction of propagation. There is, however, horizontal polarisation present in the direction of propagation. I wish to discuss several aspects of both these statements.

Horizontal Polarisation in the Direction of Propagation

When a vertically polarised signal travels over the surface of the ground the lower end of the wave front, in effect, drags behind the space wave above the ground (see figure 12). This is brought about by the ground having a higher conductivity and refractive index than the air, and causing the wave to have a lower phase velocity in the ground than in the air (or space). In fact, this is an application of the optical law which states that when a wave moves from a medium of low-refractive index to one of higher refractive index, the direction of propagation of the wave will bend towards the normal, that is it bends towards the perpendicular to the ground. In fact, below the ground the signal is almost horizontally polarised.

The effect of this is that, at a relatively low height above the ground a horizontally polarised component of the signal exists. This component is present in both the surface wave and the normally vertically polarised component of the sky wave and, surprisingly, the effect can be of significance at HF. The phenomenon allows the use of a directional receiving antenna known as the *Beverage* (see Figure 12). The Beverage antenna is basically a long wire travelling wave antenna running in the direction of the received signal. The antenna is usually terminated in a resistor equal to its characteristic impedance at the front end and the receiver at the far end. The antenna can be less than a wavelength to many wavelengths long; the longer the better.

The principle of the antenna is that it intercepts the horizontal component of the signal as it travels along the antenna. The induced signal adds in the antenna until it reaches the receiver. These antennas have been traditionally used on long wave since early times. Most amateurs may not be able to erect such an antenna long enough to be of much use on LF. The method is still worth keeping in mind. Many amateurs have certainly used Beverage antenna on 1.8MHz and higher with considerable advantage.

Horizontal Polarisation Transverse to the Direction of Propagation

It was stated above that this characteristic is ineffective at ground level. Horizontal polarisation reception at the higher medium frequencies has been of particular interest to the author, and was the main subject of an article some years ago (Ref 6). Many amateurs have made use of short or full-size dipoles on 1.8MHz for reception with great advantage, and it is felt that a more detailed discussion is in order.

Refer to figure 13. Imagine the transmitting antenna is at point 'a' and the receiving antenna at point 'b' shown as a horizontal dipole. An electromagnetic wave is a transverse wave motion and can, therefore, only be polarised perpendicular to the direction of travel of the wave. If the propagation is along the ground, direction A, that is, perpendicular to the antenna (assume a lossless situation), the strength of the signal at a given distance will depend upon the radiated power and distance. If the direction of radiation is vertical, direction C, there can be no radiation as an antenna cannot radiate off its end. If we consider a direction of propagation at an angle, direction B, to the ground then, from the geometry of the configuration, the field will have an amplitude proportional to the cosine of the angle to the ground. This is shown by the vector triangle in figure 13. In the case shown, the angle of radiation 'e' is at 60° and, therefore, the strength of this field is reduced by cos 60, that is, 0.5 or -6dB.

This cosine factor is the cosine in equation 10. In similar manner, when the signal reaches the receiver, assume a vertical antenna here for the moment, the polarisation is not parallel with it which, by the same geometry, is also proportional to the cosine of the angle to the ground. This is the second cosine function in equation 10.

If the receiving antenna is a horizontal dipole, then reception is maximum vertically and zero horizontally. Even though the transmitting antenna is vertical, the received signal has a horizontal component parallel to the ground, so long as the launching angle is not completely vertical or horizontal. The received component of the incoming signal parallel to the antenna is proportional to the sine of the angle of reception to the ground. In the case under discussion for a reception angle of 60 to the ground, the received signal will be reduced by sin 60, that is, .87 or 1.2dB. This is shown in the second vector diagram in figure 13.

On medium frequency a dipole, even a small dipole, which is balanced and accurately horizontal will give high rejec-

Tower Height Adjuster

Continued from page 15

antenna parts, leaving the motor and clutch. See figs 1 and 2. I fitted the motor to a 3mm plate with bolts, and fitted a nylon 30mm gear from a washing machine to the clutch with little bolts. The clutch was a plastic cone with a centre tensioning bolt. Another gear of 100mm diameter was mounted on a spindle attached to the motor plate with a spool for the wire to raise and lower the tower section.

The motor assembly was mounted under a carport near the tower. An up/down switch and a 12V supply allow the tower section to be raised and lowered from the operating position. To indicate the position of the tower section I fitted a potentiometer with a long arm to the raising and lowering wire. An old meter obtained from an SWR meter was used to indicate the position. The potentiometer varies the current from the 12V supply, and the meter can be calibrated with the tower position. See figs 3, 4, 5, 6 and 7. **ar**

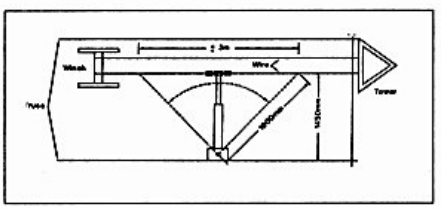

Figure 6. Connection of Arm to Pot.

tion against vertical polarisation. Such an antenna will reject the surface wave and most noise and enhance the high-angle wave. On 160m horizontal polarised reception is a great advantage in the "interference zone" where the surface wave equals the ionospheric wave and beyond up to about 800km.

(Surprisingly horizontally polarised reception on 160m not only gives better reception on short hop signals, but often gives better results for DX reception. The reason for this is not easily explained and could be a subject for research).

On low frequency, one might expect to obtain a similar advantage. However, such is not the case, and this leads to the next subject.

Lack of High Angle Radiation on Low Frequency

The lack of high-angle radiation on LF is not surprising when you look at equation 7 and also observe Figure 11. From equation 8, it is obvious that at frequencies much above 200kHz the reflection coefficient at the conductivity discontinuity will be poor at low angles. At this rate there would be no ionospheric propagation of the type described here in the broadcast band at all.

There must be a transition between reflection at the conductivity discontinuity described in Part 3 of this article, and reflection due to decreasing effective refractive index with height described in Part 2. What might happen is that, at a high angle of radiation — say at 200kHz — the reflection at the discontinuity is very poor. Some of the signal might pass through and be reflected by the E layer in the manner described in Part 2 (HF type reflection). This change should become more obvious with increasing frequency, and probably the transition takes place somewhere in the broadcast band. Texts on this subject are very poor in information on ionospheric propagation on medium frequencies.

If a high-angle signal exists it should be detectable with a dipole. Also, if a dual path exists, this should also be detectable in the form of very slow fading under certain conditions. The author has tried a number of experiments at his QTH to detect high-angle radiation using a dipole. Non-directional beacons at the LF end of the beacon band were used as experimental signals. So far, no high angle of radiation has been detectable. This would tend to indicate that the method of calculating ionospheric reflection coefficient given by Watt is correct, at least below 250kHz.

The main difficulty with this experiment is that a low short horizontal dipole

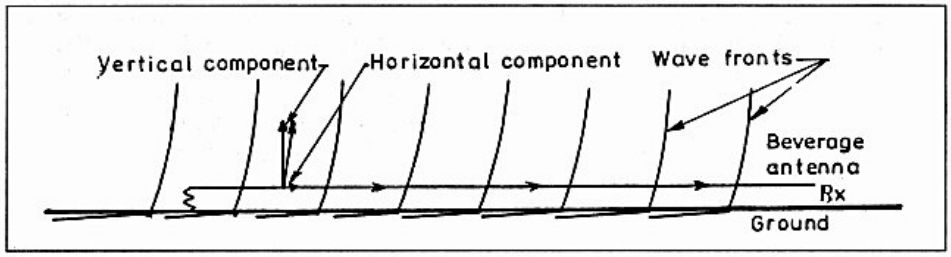

Fig 12 Showing how a travelling wave is formed on a Beverage antenna.

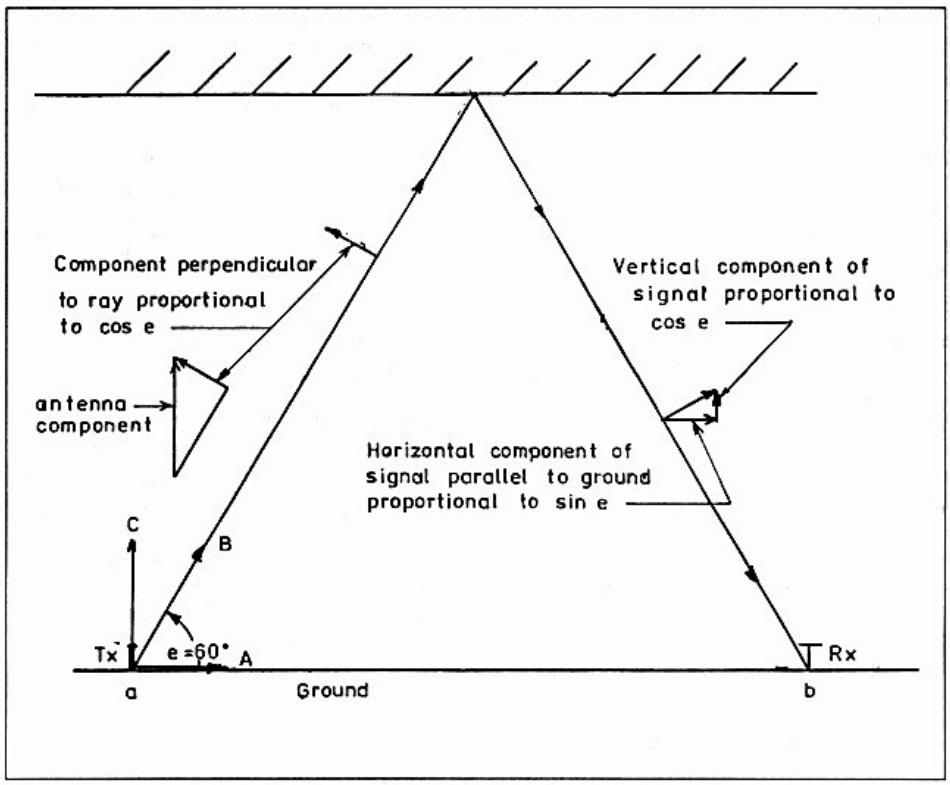

Fig 13 Showing that a signal ray with a high angle of elevation has a strong horizontally polarised component even when transmitting antenna is vertical.

is very inefficient. This is firstly because it is short and secondly because of interaction with the ground at a low height. The efficiency of a low short dipole decreases approximately with the fourth power of the inverse frequency. For example, if a dipole delivers 100 microvolts to a receiver at 1.8MHz for the same signal strength it will deliver 1 microvolt at 196kHz. A second difficulty with the experiment is that the surface wave is very strong and a high vertical rejection is required by the dipole.

This low output is not impossible to work with. If there was any high-angle signal content in the received signal, it should be detectable. The experiment is certainly worth repeating with a bigger dipole. There must be plenty of people living in the country with big dipoles.

The Sporadic E Similarity

It was stated in part 3 that this plane surface type reflection was unique to LF. However, one can't help observing the similarity between this type of reflection and reflection by sporadic E at HF/VHF. Reflection by sporadic E was described recently in an excellent article in 'AR' (Ref 7). Sporadic E is similar, in that it is in the form of a thin mirror-like layer, the reflection coefficient is less the higher the frequency, and it is better at a low angle than at a high angle. It is also noted that a high-angle signal is only partly reflected and part is reflected by the layer above.

Surprisingly, there is such a thing as "sporadic D"! Usually referred to in LF as ionospheric disturbances. Stratified ionised layers can form between 50 and 90km above the ground, and are described by Watt. Although they do not reflect HF, and may result in increased loss, at LF they result in signals being reflected at a lower height.

VLF Ducting

Wave guide type ducting between the

D layer and ground for LF waves between 10 and 30kHz is fairly well known, and often referred to in articles on the subject. Although this frequency range falls outside that covered in this article, it is interesting to show how ducting relates to all that we have been talking about. Some explanation is in order.

There is no space available to explain wave guide theory here, and interested readers should refer to the many texts on the subject. Even at 10kHz, the gap between the ionosphere and ground is more than a wavelength. Briefly, when an electromagnetic wave is ducted in a wave guide with surfaces more than a wavelength apart, waves will travel along the guide, being reflected between the two surfaces at such an angle that the wave fronts are all in phase vertically. That is, in the case of the VLF propagation, each wave front advances as a single unit spanning vertically from the ground to the ionosphere. The angle of reflection of the waves forming the waveguide mode is critical. The most basic mode is the TEM1 mode. The TEM2 mode is a second-order resonance etc. The angle of the rays to the surface forming the mode decreases with increasing frequency.

Propagation efficiency for a particular mode between the ground and ionosphere is low, when the angle of the ray to the ground is high, and is maximum when the angle to the ground is zero. Above a certain frequency, the particular wave guide mode parts company from the ground, and exists under the ionosphere only, and thus becomes decoupled from the antenna. The TEM1 mode reaches maximum efficiency between 12 and 20kHz. The TEM2 mode reaches maximum efficiency between 20 and 40kHz, depending upon the time of day or night. Above the TEM3 mode, the modes become so mixed they are of little significance.

The phase velocity of propagation making use of these modes is very accurately predictable, and it is on this principle that the Omega navigation system operates.

In brief, propagation at 200kHz is the same as at 10kHz, in that it depends on reflection between two low-conductivity concentric spherical surfaces between 70 and 90km apart — the ground and the conducting or D region of the ionosphere. One difference is that, at the low-frequency end of the band, the propagation is dominated by wave guide modes which control the wave front velocity, and in general make propagation very predictable over global distances. With increasing frequency, propagation efficiency falls off, until other propagation media become dominant. At frequencies below 10kHz, the high angle of reflection determined by the TEM1 mode as well as insufficient conductivity in the D region causes propagation efficiency to fall off.

Final

With all this I will go back into my shack for a while and leave readers to think about it. After a while, I would like to hear some interesting discussion on the subject.

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6. Home Station Antenna for 160 Metres, Amateur Radio, May to December 1971
7. Sporadic E Propagation at VHF, Peter Stackpole VK1RX, *Amateur Radio* June 1989.

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Remember to leave a three-second break between overs when using a repeater

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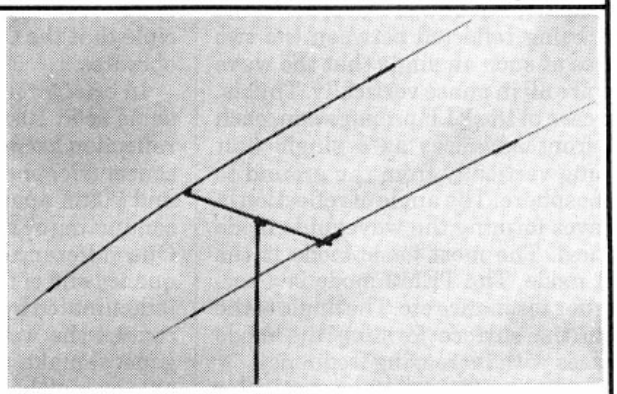
Weight	8kg



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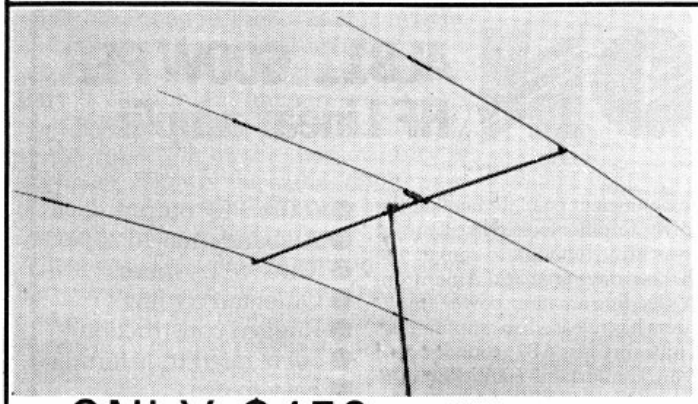

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Gain	6, 6.2, 7 dBd
F/B Ratio	21, 15, 16 dB
Power	2 KW PEP
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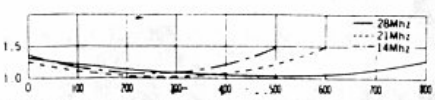
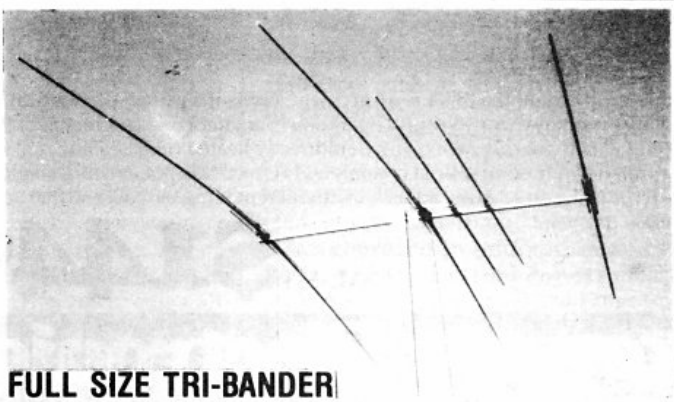
BAND — 14/21/28 MHz
GAIN — 8.5, 8.5, 9.5 dB
F B RATIO — 25dB OR BETTER
POWER — 3kw
BOOM — 4m
MAX ELEMENT LENGTH — 10.6m
WEIGHT — 22kg





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Random Radiators

RON FISHER VK3OM AND
RON COOK VK3AFW

Wells Quadrants

THIS INFORMATION WAS forwarded by Peter VK3BWD via two metres and is reproduced here as a slightly edited transcript.

Readers will now be aware of the reactivation of the VNG Time and Frequency Standard transmissions from Llandilo following the demise of the service from Lyndhurst. In various news items about the new service the antennas used are described; indeed, on the front cover of *AR* March 1989 there is a photograph of one of the Wells Quadrant aerials used on the three frequencies now in use.

Some readers may not have encountered the Wells Quadrant Aerial. Wells was employed by the Marconi Wireless Telegraph Company and published a number of remarkable technical papers during 1939-45, remarkable at least because publication of technical information on antennas was generally prohibited by wartime security.

One of these aerials was the Quadrant Aerial, an omnidirectional, horizontal, wideband aerial for short waves. The name gives a clue to the problem Wells was trying to solve; what horizontal aerial will give an omnidirectional azimuth pattern at some frequency and will not depart from the pattern by more than a predetermined amount as the frequency is varied over a reasonably wide band. Amateurs with some experience of HF transmissions in the maritime or aeronautical service will understand the need for a base station radiation pattern without too many holes in it. Also, such an antenna is useful when there is a need to operate on several spot frequencies in a given band, for example when using the calling and distress frequency of 4,125kHz, it is necessary to switch promptly to a radio telephone frequency around 4,400kHz.

Wells found that an essentially omnidirectional pattern, rather like a square with rounded corners, could be obtained with the Quadrant Aerial which consists of two horizontal arms running at right angles to each other and fed at the apex, that is to say a 90° vee antenna. He found that the radiation pattern was good when the arms were of the order of a half wavelength long, but as the frequency was raised the pattern broke up into a series of significant lobes and nulls. Wells also examined the use of a cage of symmetrically disposed conductors instead of a single conductor in each leg; in this he was trying to extend the useful bandwidth to around an octave, and reduce the excursions of feedpoint impedance with change of frequency.

He settled on a practical cage of four wires just as is shown in the photo of the cage at Llandilo.

The Quadrant Aerial has stood the test of time. There are several of them at OTC Melbourne Radio, Cape Schanck on the Victorian coast. One has a leg length of 14 metres at 10.7 metres above the ground, and is used to receive from 7 to 12.3MHz, and another of leg length 18.9 metres some 18 metres above the ground radiates a kilowatt or more in the range 6.2 to 7.6MHz. Many others are to be seen around the country.

Wells reported an extensive range of measurements and practical results for stacking and grouping quadrant aerials in his paper in the *Journal of the Institution of Electrical Engineers*, UK, Volume 91 pt 3, 1944, pp 182-193.

Thank you Peter for that contribution.

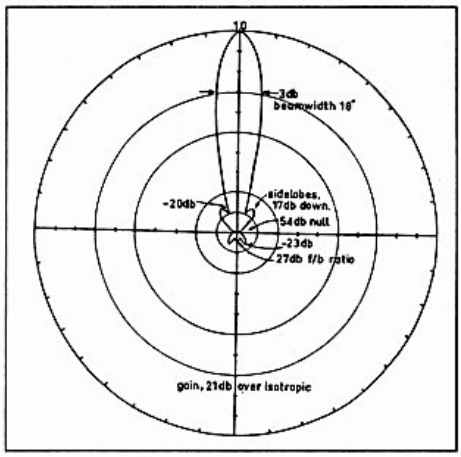

Figure 1. Fifteen-element Quad Yagi Antenna Pattern. Test frequency 144.1MHz. Circles are at 5dB intervals. The boom length was 10.1m (33 ft). See text for element details.

NVIS

What is NVIS? Bill VK3MI adds to his previous contribution with the following explanation.

Further to the notes on high-angle propagation from low horizontal antennas (Random Radiators *AR* p8 May 1991), there is now a set of new high-tech initials for this technique! These are "NVIS" for Near Vertical Incidence Skywave propagation (*RadCom* RSGB p32 Jan 1991) referring to its use for military HF communications.

Historically, of course, the British Army used this technique in the 1930s, intentionally or otherwise, for low power field portable stations in the 2-8MHz range (Signal Training, All Arms 1937) using low "Windom" antennas.

Then, when re-equipped by Racal Pty Ltd in the 1960s for the same type of communications, the very low horizontal loop was the antenna applied to the job, and the propagation technique was well understood. In addition, the SSB equipment introduced was much less susceptible to "selective fade" in the overlap between direct and skywave propagation which had bedevilled the previously used AM-style equipment.

From the early 1950s, the Country Fire Authority in Victoria, and later the State Emergency Services and other similar public utilities in the 3.75MHz frequency band have used this style of propagation for reliable local communication except, of course, during severe ionospheric disturbances.

However, with this modern acronym applied, NVIS propagation may finally achieve prominence in the amateur field, at least among the local rag-chew brigade, though NOT with the DXers!

Quads Fight Back

From Ian VK3ALZ comes some notes in support of the Quad. I have made some minor editorial changes to the text as supplied.

Fourteen MHz is not an ideal antenna comparison frequency. Twenty-eight MHz is a better choice - in addition on F2 paths a low wave angle is desirable at this frequency, therefore, with few exceptions,the antenna with the sharper pattern will rightly be the best at 28MHz.

At VHF the situation is different, as a free space environment is easy to achieve. If we concentrate on measuring over tropospheric paths, the better antenna will produce the best result.

In the article in an earlier Random Radiators, mention was made of doing measurements at UHF or microwave frequencies. In my view this is a big mistake, as a parasitic array at UHF or microwave is not the same antenna as at HF. This is due to a number of factors, of which the main one is the L/d ratio of the elements. If we were to use the same L/d ratio at 1296MHz as at 14MHz, the skin effect losses in the thin element could be excessive, bearing in mind the high currents in the driven and parasitic elements. Hence a different performance would be measured.

Also there is distortion of the pattern due to the metal boom and increased dielectric

losses at 1296MHz. If you change the L/d ratio to reduce the losses you do not have the same antenna any more.

In reference to long Yagis, the maximum gain long Yagi, eg the original W2NLY-W6QKI 144MHz design will always have minor lobes. If this design is scaled to 432MHz the pattern becomes a mass of minor lobes.

My experiments with long quads at 432MHz (in the late '60s and early '70s) using W2NLY spacings always produced an antenna with a clean pattern. Subsequent experiments showed that the close spaced directors in this design were redundant for the quad configuration.

At 1296MHz the design still produced an acceptable pattern. The spacings used are as follows:

Reflector: 0.15 to 0.18
(adjust for best F/B)
Dir #1: 0.15
Dir #2: 0.20
Dir #3: 0.25
Dir #4: 0.32
Dir #4: 0.32
Dir #n: 0.32
ie fixed spacing from director #4 on.

The same spacing is used on all bands, and the driven element is always one wavelength long. The reflector is 1.05 wavelengths and the directors are 0.95 wavelengths long. L/d compensation as per standard texts is necessary.

For 432MHz I generally use a wooden boom. On 144MHz it is okay to run the boom through the centre of the quad. I use circular elements on 432 and 1296, although it doesn't seen to matter if square elements are used. The circular elements are easier to make, an important consideration if you need a lot.

I have found that replacing the wire reflector on 432 and 1296 with a perforated metal screen gives a greatly improved F/B ratio and a slight improvement in forward gain.

The measured radiation pattern for a long Yagi using Quad elements is shown in figure 1. The dimensions are as described in the preceding text.

Thank you Ian for sharing your knowledge and experience. Certainly your many fine DX contacts attest to the effectiveness of your long quads.

A Beam for all Bands (Well, nearly)

Apart from the log periodic type of aerial, there does not appear to be any commercial beam aerial capable of operating on all five HF bands from 14-30MHz. Faced with a desire to have better performance than the old G5RV could give, but restrained by the need to keep the load on the top of the tower to a reasonable level, I delved into the handbooks to see what could be done. I was also influenced by having recently read John Kraus' autobiographical account of antenna development, "Big Ear". The good old W8JK seemed worth investigating.

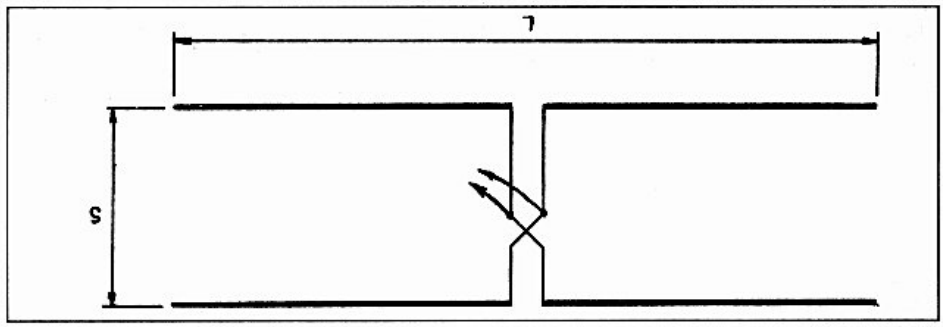

Figure 2. W8JK Schematic (plan view). For 14-30MHz operation, L = 10.21m (33'6"). S = 2.59m (8'6"). The spacing between the two parts of each dipole can be about 150mm (6"). The feedline is connected to the centre of the phasing line. This impedance of these is not critical; however, both must be low loss with high VSWRXs. Three hundred or 450 ohm "ladder line" or similar home-brew open-wire line would be suitable.

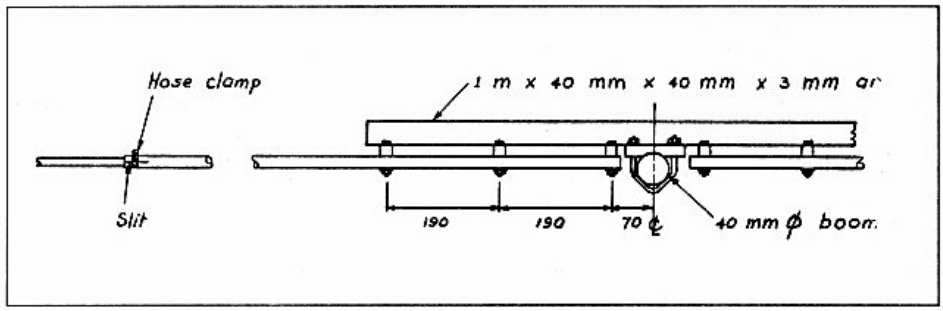

Figure 3. Construction Details. The angle is aluminium and clamped to the aluminium boom using standard TV antenna fittings. Each element consists of four lengths of aluminium tubing fitted together by using a hacksaw to make a slot in the larger tube, sliding the smaller tube inside about 75mm (3") and clamping with a stainless steel hose clamp. Element details: 22mm dia (7/8") 1.50m; 16mm dia (5/8") 1.30m; 12.5mm dia (1/2") 1.275m; 9.5mm dia (3/8") 1.185m. See figure 4 for details of element to angle mount.

It has the advantage of requiring only a 9ft boom and two 33ft long elements, yet can cover 14-35MHz. A plumber's delight construction using aluminium tube elements and 300-ohm ladder line for the feeder was settled on. Like most amateurs, I have thought that open wire or ladder line was impractical for a rotating array. Not so. The judicious use of TV-type insulated standoffs and a modest loop of feeder provides a practical solution.

The major features of the W8JK may be summarised as follows:

- Covers a 2.5:1 frequency range.
- Has zero radiation vertically above the antenna, regardless of height above the ground.
- It is bidirectional so long path/short path considerations do not matter.
- Gain at 14MHz is between 4.5-5dB (free space) and rises to about 6-7dB at 28MHz.
- Construction is simple, it can be a wood and wire, or all metal tube device. This means a cheap and light beam.
- The azimuth radiation pattern is a simple figure of eight, becoming sharper as the frequency is increased.
- On 14MHz it is a two-element beam with half-wave elements, centre fed, becoming a two-element beam with full-wave elements, end feed on 28MHz.
- Dimensions are not critical.

The result is a performance not much short of the standard three-element tribander, for much less in price, but with the additional bonus of operation on 18, 24 (and 27MHz if you have the need to listen on that band). Of course, the ability to operate over such a wide range of frequencies comes with the small inconvenience of using an ATU. The (you guessed it) Z match is ideal. The twin wire feeder and the range of impedances seen at the end of it are easily accommodated by this unit.

Details of construction are given in figures 2, 3 and 4. In service, the beam

performed much as was expected. It was outclassed by the "big guns" used by the famous DXers, but was usually at least two S units better than the G5RV used as the reference antenna. Disadvantages of the beam are:

- The maximum gain is limited by losses in the elements and feedline. These losses are probably no more than 1dB, especially for the tube construction as compared with the wire version.
- As the front-to-back ratio is 1 there may be occasional problems with interference not apparent to conventional beam users.
- Short skip signals are weaker than for a conventional beam because of the cancellation of high angle radiation.

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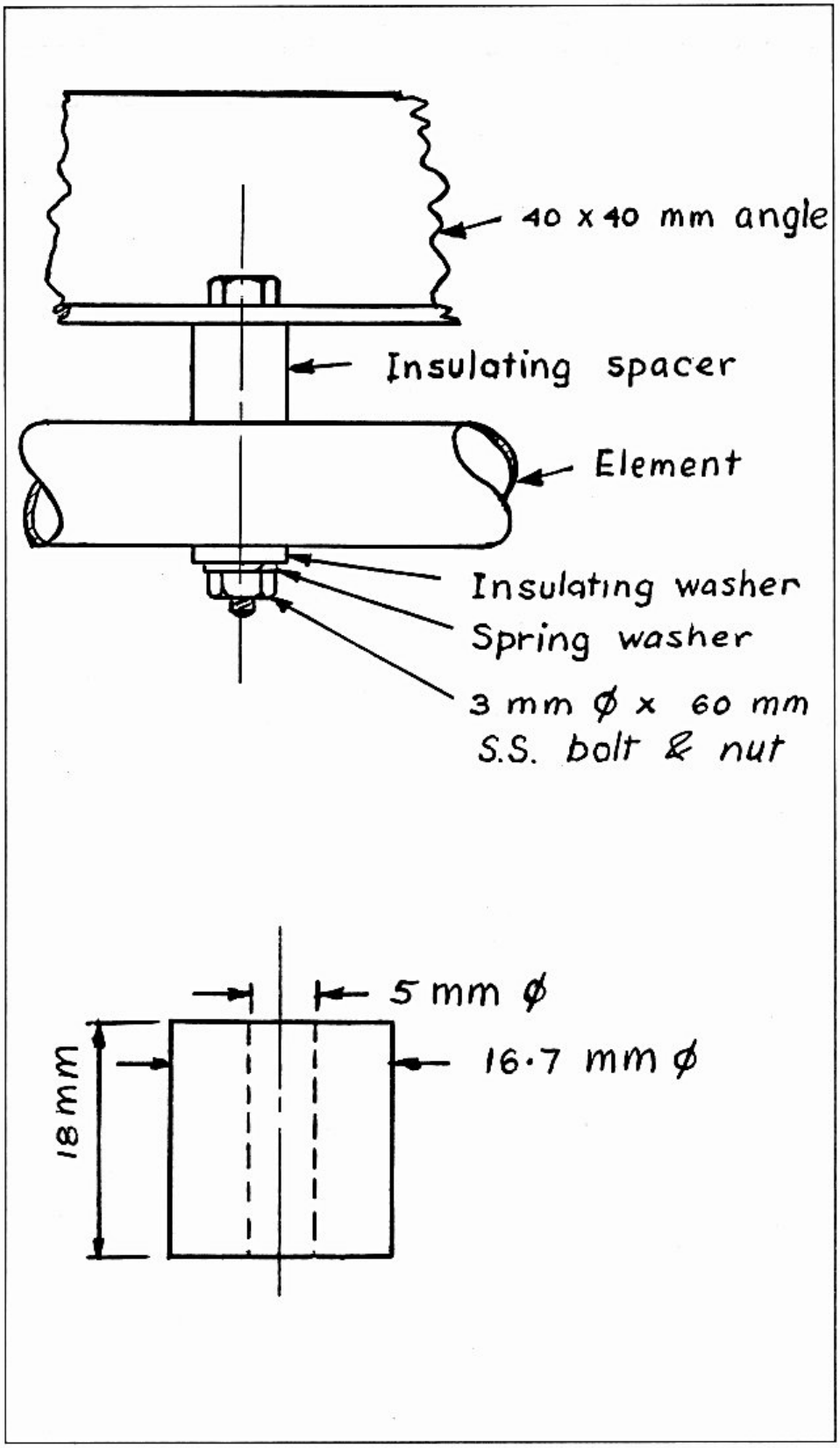

Figure 4
(a) Element Mount Details
(b) Insulating Spacer Details
Element Mounting Details. Insulator material polycarbonate. Other plastics may be suitable.
Note: The bolt has a sleeve of plastic tubing (ex coax outer) as additional insulation.

Getting Started in Amateur Radio Satellites - Part 8

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LAST MONTH THE SUBJECT was the packet radio satellites. Maybe you've already had some success in that area. This month I'm going to take an overview of all the Oscars, past and present. We'll then take a mutual look into that big crystal ball in the sky. Who knows what we'll find.

You may have heard expressions like "phase 3C" etc. No great mystery. This refers to the categories or developmental phases of the Oscars. I'll describe them briefly and then look at the features of the groups one at a time.

Phase 1, as the name suggests, includes the early satellites with beacon transmitters only.

Phase 2 development included the early transponder satellites, the scientific experimental birds and the new microsats. Much more development will take place in this category. Phase 1 and 2 satellites are/were all in near-circular, low-earth orbits.

Phase 3 saw the deployment into high, elliptical orbits of much more sophisticated spacecraft. We can expect more phase 3 spacecraft. Planning for Phase 3D is already well under way.

Phase 4 is still very much in the early planning stage. There is much conjecture as to whether it will proceed to fruition. If it does, it will take amateur radio into the realm of geo-stationary satellites with the potential for spacecraft linking and true worldwide VHF, UHF and SHF communication. The ultimate Oscars! Well, nearly ... as we'll see later.

Now, some detail. The phase 1 satellites, Oscars 1 to 5, carried various kinds of beacons. From the rudimentary Oscar-1's HI, HI, HI in morse, to some quite intricate telemetry devices in the later phase 1 birds. An enormous amount was learned about the potential of amateur radio satellites from the first phase of development. The early pioneers of ham radio in space have long ago decayed into the atmosphere, so let's look at the satellites in the next phase of development. Many of these are still operational.

The phase 2 satellites represent the largest group. Being in near circular orbits they are relatively easy to launch and therefore they have the greatest potential for further development, particularly in the digital communication area. This group includes Oscars 6, 7 and 8, the experimental Uosats ie. Oscars 9, 11, 14 and 15 and the current batch of microsats, Oscars 16, 17, 18 and 19. The two Japanese birds, Oscars 12 and 20, and the Russian Oscar 21, are also in this category.

Although not called Oscars, the Russian "Radio Sputniks" RS-1 to RS-11 have fallen into these first two categories. The latest radio sputnik was given the name Oscar 21 when it came into service. Is that glasnost or perestroika at work? The Oscars are numbered according to their order of achieving orbit and controlled operation. The oldest Oscar still in orbit and operational is Oscar-10. The previous oldest was Oscar-9 (UoSat-1) which entered the atmosphere and burned up in November 1989. Oscar-10's high perigee of nearly 4200km will ensure that it stays aloft for a very long time, although it is no longer under ground control due to radiation damage to the on-board computer. If it remains operational (and doesn't hit anything) it should go on to become the "grand old bird" of the Oscars.

The phase 3 group consists of only two satellites, but these are the most sophisticated so far. They are, of course, Oscar-10 and Oscar-13. The high elliptical orbits require expensive launches. There will never be a lot of phase 3 birds up there at once. Phase 3A didn't make it into orbit, phase 3B did make it safely into orbit to become Oscar-10, phase 3C became Oscar-13 and phase 3D is still in planning. They carry rather comprehensive systems with attitude control and lots of goodies. Phase 3D may even have three axis stabilisation to allow earth-pointing antennas at all times. Phase 3 satellites carry multiple transponders and extensive telemetry, all kept under control by a u-beaut housekeeping computer. No doubt phase 3D will contain high speed data and mailbox capability and transponders up to at least mode S. Its orbit and design are under intensive study at present.

Phase 4 is as yet only a dream. But then we wouldn't have an amateur radio satellite program at all if far-sighted, hard-working talented people hadn't turned dreams into reality over the past 30 years. Phase 4 is often called the ultimate amateur satellite system. It envisages a series of three satellite in geo-stationary orbit. All will be mutually "visible" to each other. They can, therefore, be interconnected to give true worldwide coverage. They will be given the name AMSTAR. Amstar-1 will be over the Atlantic Ocean, on the equator, of course. Amstar-2 will be over the Pacific Ocean, and Amstar-3 will be over the Indian Ocean. This will be the most ambitious amateur radio project of all time. It will take many years of planning and will draw on the total engineering experience of the Amsat organisations worldwide. It will require huge injection of funds, much of which will have to come from outside amateur radio. It will ultimately test our operating practices and procedures to the limit. It may well be our application of the Amateur's Code that decides its success or otherwise. (And I don't mean Morse). Have you re-read the Amateur's Code recently?

Unfortunately, the news is not good regarding phase 4. It was announced in April 1991 from AMSAT-NA headquarters that the project has been "canned" due to lack of funds in the foreseeable future. We can only hope that this very ambitious project will one day be brought out of mothballs and go on to completion.

Now what about the immediate future ... ?

With phase 3D planning well under way there seems little doubt that it will proceed to completion. The sheer expense of projects like phase 4 seems to indicate that much future development will take place in the phase 2 and phase 3 series. The microsat concept has been developed with this in mind. These remarkably small devices (they are only 9" cubes) offer the greatest value-for-money amateur satellites so far. The first batch of four microsats launched in early 1990 have achieved outstanding results. The next batch may include an Australian microsat. It will be known as VKSAT. A

planning group has already been established to get this under way. If you're interested in taking part in this exciting project, get in touch with the secretary, Andrew Woolf, at the Australian Space Engineering Research Association, PO Box 184, Ryde NSW 2112. You don't need to be highly technically qualified to make a contribution. There are project groups operating in Sydney, Melbourne and Adelaide. The microsats seem to be ideally suited to digital modes of communication. It looks like flying mailboxes with data rates of 9600 bps and above will become the order of the day in the not too distant future. These little birds could become our most efficient means of worldwide amateur radio communication.

There will, of course, be other goodies from time to time. Like the long-awaited French Arsene satellite. This device will orbit the equator like a geo-stationary bird but it will have a highly elliptical orbit. It should apogee at about 36,000km and perigee at about 20,000km. It will carry mode B digital and mode S linear transponders. This will be the first venture by AMSAT-France and a very ambitious one it is. Good luck to them. If it works as planned, it will be better than any other Oscar yet launched.

Looking further ahead ...

Quite apart from further development in the Oscars, and there will no doubt be many, there are two very exciting projects on the horizon. they are both timed to take place in 1992, the international space year (ISY). The first is an international sailing race to the moon. Yes, you read that correctly, a sailing race to the moon to commemorate the 500th anniversary of Columbus' epic journey of 1492. Do you remember that from school days? "In fourteen hundred and ninety two, Columbus sailed the ocean blue". It will be known as the "Columbus 500 Space Sail Competition", an open international competition to design and launch lightweight spacecraft with huge "sails" made like the radiometer devices we all remember spinning around, powered by sunlight, on the windowsill of our school science classroom.

The second project is just as exciting. A lunar polar prospector satellite. This project has been on NASA's books since the end of the manned lunar missions. It is a scientific remote sensing package that will orbit the moon's poles, spending much time over the lunar polar regions. It will be looking for water which may exist as ice in the permanently shadowed polar regions of the moon. It will also be looking for radon and other gases on the lunar surface. Sources of these elements would be of great benefit to any permanently manned moon mission.

Both of these projects involve amateur radio. The AMSAT organisation has been approached by both NASA and WSF, the World Space Foundation. These are the principal bodies involved in the two history-making events. AMSAT will supply much of the communications know-how and equipment for telecommand and remote sensing telemetry. Knowledge gained from the microsats will be critical in the design, fabrication and testing of the communication packages.

Of course, both these projects will have amateur radio transponders. They will be in the UHF/microwave regions, probably L and C band. We'll need to brush up on our techniques and get ourselves into gear. Who said amateur radio is on the way out? Imagine the excitement of working through a transponder in orbit around the moon? With projects like this already announced, who knows what's on the back-room drawing boards? But you can bet that if there is even the remotest possibility, then amateur radio will be involved through AMSAT and its worldwide affiliates. It seems that our reputation is such already that well respected engineers and organisations are seeking out our participation. Take a bow everybody. The next two parts in the series will deal with orbital geometry, keplerian elements and the computers that (hopefully) make sense of these essential aspects of amateur radio satellite operations. **ar**

Equipment Review

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The Kenwood TS-450S All Mode HF Transceiver

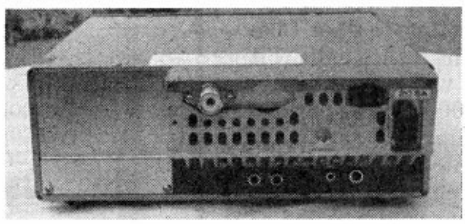
IT SEEMS THAT THE DESIGN staff at Kenwood have really been working overtime, with three new HF transceivers hitting the deck over the past few months. Firstly, the TS-850S, which seems to be creating quite a stir amongst the DX experts, and now a replacement for the popular TS-440S. We hope to take a close look at the 850 in the very near future, but for the moment we will concentrate on the 450. However, to round out the story, the new 450 is also available with 6m coverage, and in this guise is called the TS-690S.

The TS-450S follows the line started with the TS-430S back in 1983. Yes, it doesn't seem that far back. The TS-440S was introduced in 1986, so both of these have been around a long time. All three models share a very distinct family resemblance. All were built to provide a general coverage receiver with transmit output on all of the HF amateur bands. All have 100 watts output, and the two later models have built-in automatic antenna tuners. Front panel size is the same for all transceivers, with the depth varying slightly with each model. The new TS-450S is actually 8mm shorter than the TS-440, however, it weighs in at 200g more than its predecessor.

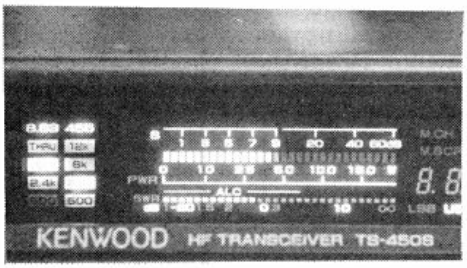
Probably the biggest change to the casual observer is the new colour - it's now charcoal black in place of the old silver grey. I've never been enthusiastic about black equipment, but I have to admit that the TS-450 looks very smart.

The TS-450S' New Features

Many of the new features on the 450 have been carried over from some of recent Kenwood HF transceivers such as the TS-140 and the TS-950, and many are brand new. Let's look at some of them. The meter is now a digital bar type with a multi-function display. In other words, you can monitor two different parameters at the same time. On receive, the 'S' meter function is on at all times. As well as this, the audio output level from the appropriate detector in use can also be monitored. This function can be selected or de-selected as required. On transmit, the normal indication is for power output, with either ALC or SWR measurements as selectable options.



Rear view of the TS-450S. The blank panel on the left takes the 6m final for the TS-690S



The Metering System on the TS-450S. Note filter selection indicator on the left.

Memory channel selection now has a separate control - you don't have the confusion of using the normal tuning knob. The memory channel knob becomes the VFO channel control when in the VFO mode.

This useful feature was first seen in the TS-140/680 and later on the TS-950. On the 450, the normal step is 10kHz, but this can be changed to either one, two or five kHz. As is usual these days, there are two VFOs, but now on the 450, thanks to the new direct digital synthesizer, the tuning is much smoother with an almost complete absence of clicks and plops. Also as a result of this, a tuning rate of one kHz per tuning knob revolution in 1Hz steps is provided as a selectable option from the standard 10kHz per knob revolution. As with the TS-440, 100 memory channels are provided. As well as storing frequency and mode, they can store filter selection and AIP selection (more about AIP soon). With the addition of the separate memory selector control, and some changes to the memory controls, the whole memory system is now much easier to use. As with the 440, memories can be allocated for such things as setting limits for programmable band scan and for split frequency operation. Ten memories are available for setting tuning limits for, say, 10 segments of amateur bands to allow VFO tuning confined to those band segments. This feature is certainly a boon to the contest operator for setting up sections of the bands required to either tune through or scan across.

The AIP or "Advanced Intercept Point" first featured on the TS-950S and then on the TS-850, is included in the TS-450. The AIP allows the operator to choose between high front end gain (AIP out), or for a reduced gain with reduced noise floor level and increased intermodulation characteristics. One very nice features of this is that AIP is automatically switched in for reception on the lower frequency bands where lower gain is very desirable. However, if the higher gain is needed under perhaps low ambient noise portable operation, it can be switched out.

Filter selection has been upgraded on the TS-450S. It is now possible to make independent filter selection in both the 455kHz IF and the 8.83MHz IF channels. A selection button is provided for each IF channel and the selection takes place sequentially. This is, of course, provided that some of the optional filters are installed. A special display to the left of the meter shows the selection. Strangely though, no display indicator is provided for the narrow SSB filter, although this filter can be installed in the transceiver. You can, though, have a wonderful choice of selectivity for AM reception with either 12 or 6, 6 with tighter skirt selectivity or 2.4kHz. No actual 6kHz crystal filter, as offered with the R-5000 receiver or the TS-930 and TS-940 transceivers, and even the old TS-430, is available for the TS-450.

On transmit mode, better control over power output is provided with both a carrier and a power control. The "power" control will reduce the transmitter output on SSB down to about eight watts. With the accurate power metering, it will be easy for novice operators to set the 450 up for exactly 30 watts output. Transmitter cooling has come in for attention with two cooling fans built into the final amplifier. These come on as soon as the transmitter is keyed up on any mode. The

Australian version of the TS-450S will come complete with a built-in automatic antenna tuner, but the TS-690 (the version with 6m coverage) will not have the ATU as standard. It will, however, be available as an option. Interestingly, both transceivers will sell for the same price. Take your pick, an auto ATU or six metres. Both transceivers have been configured to connect to the Kenwood DSP-100 digital processor unit. According to the Kenwood literature, this unit converts the signal into a digital waveform (and back to analogue) and permits the audio passband to be tailored for maximum clarity. As a DSP-100 was not included with our review transceiver, we were unable to check its performance.

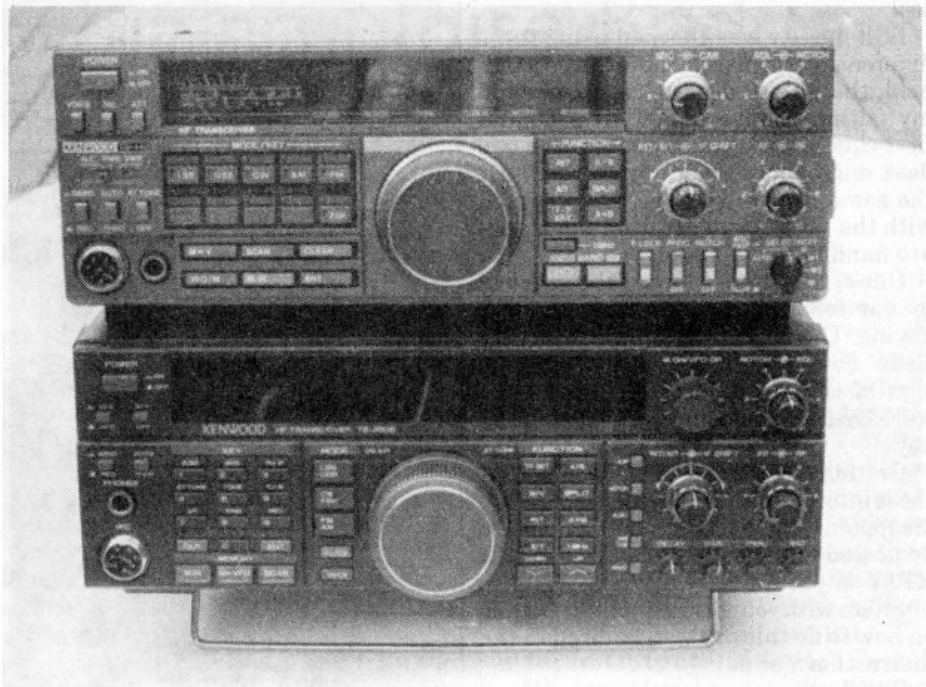
The TS-450S on the Air

The first thing noted was the improved feel of the main tuning control. Having just been reacquainted with the TS-430 (the old original), I think that the feel of the main tuning deteriorated somewhat on the 440S. It lacked the finger hole provided on the 430's tuning knob. It also had a rather sharp edge at the front, making it uncomfortable to rotate by rolling your finger around the circumference. Well, the 450 doesn't have a tuning knob with a finger hole, but it is very much smoother and is, in fact, not far behind the famous 930/40/50 tuning knob. As with the earlier model, the dial drag is fully adjustable.

With the AIP switched out, the receiver felt very lively. I did a side by side test against the 440, and while no discernible difference could be detected in signal readability, the 450 certainly produced more audio output at a given setting on the audio gain control. I am sure many mobile operators will appreciate the extra gain. Lack of receiver gain is a common complaint from TS-440 owners using their rigs under mobile conditions.

Next thing noted was the very marked increase in status indicators. There is one for just about everything. In fact, the only thing that lacks an indicator is the receiver RF attenuator. Have you ever wondered why your receiver sounds dead? Maybe the next model will include an indicator for this. One of the nice features on the later Kenwood transceivers is the automatic sideband selection when changing bands. Naturally the TS-450 has this feature too.

Frequency readout is to 10Hz and is certainly accurate to within better than +/- 50Hz. If you need better stability than this, then you should order the SO-2 superior stability temperature compensated crystal oscillator. This has a stability of +/-5 10^7 which should please the most critical. The RIT/XIT readout is to the nearest 100Hz. Incidentally, the RIT/XIT can be programmed to cover either +/- 1.1 or +/- 2.2kHz. This is one of the many functions selectable when the transceiver power is switched on.



The Old and the New. The TS-440S on top, the new TS-450S below.

Received audio quality was very good. On both SSB and AM the audio was clean and well balanced, with very low distortion at normal listening levels. I checked the SSB/CW product detector distortion and found it to be only 0.6 per cent, an excellent figure. The internal speaker produced very acceptable quality, but the transceiver really deserves a good external speaker to make the most of the rig's capability. The headphone output is compatible with stereo phones, and the output level has been set to suit low impedance headphones.

AGC has fast or slow selection, but there is no provision to disable it. The slow position produces very well controlled action with no sign of pumping on decay or clicking on make. To be critical, I would prefer the slow action to be just a bit slower. In fact, come to think of it, I have yet to see an amateur transceiver the AGC of which was anywhere near too slow. I note that the noise blanker now has a normal and wide selection. While the old Russian Woodpecker has all but disappeared, it seems to have been replaced by several other intermittent nasties, so I am sure that the wide noise blanker will come in handy from time to time. The level of blanking is not adjustable, but seems to have been rather well set. Some cross-modulation is noticeable, but overall is not too bad.

I am glad to see that the speech synthesised frequency readout is still available as an option. I am sure our sight-impaired amateurs will appreciate this.

In the QRM reduction department, the TS-450 has an IF shift and an audio notch filter. Both of these have been with us for a long time, and are still very worthwhile. In fact, I much prefer the audio type notch filter to the more upmarket IF type. The latter usually has a notch which is too wide at the top of the curve, and so affects the audio quality to a very marked extent. The audio type as fitted to the TS-450 is sometimes a bit difficult to set but,once adjusted, is very effective and does not cause any loss of quality.

Of course the receiver is only half the story. Let's see how the transmitter performs. Firstly, the output power was checked and found to be right up to the 100 watt mark on all bands. Although we did not have a TS-690 to test, is was noted that the output on six metres is a very healthy 50 watts. There is also a separate SO-239 connector for the 6m antenna, or you can switch both 6m and HF output to the same connector. All very nice.

An interesting point is that the power supply rating for full output needs an output of 20.5 amps. Although my power supplies are only rated at 20 amps, they didn't blow up or, for that matter, do anything strange at all.

Actually putting the transmitter on air produced the first surprise. The two fans came on straight away. While they are not too intrusive, they are not exactly whisper quiet either. However, running all the time, they should keep things very

cool.

SSB quality was checked using three different microphones. The MC-42S handheld, the MC-60 desk microphone, and my faithful Shure 444D. All produced first-class audio, but in general the two desk microphones were preferred. Just the same, you will not be disappointed with the results you get from the standard hand mic.

One of the things I haven't been asked by our readers to check on is the CW keying. The 450S's CW output was very clean. Several checks were run, but no sign of clicks was detected. The tests were carried out using a straight hand key.

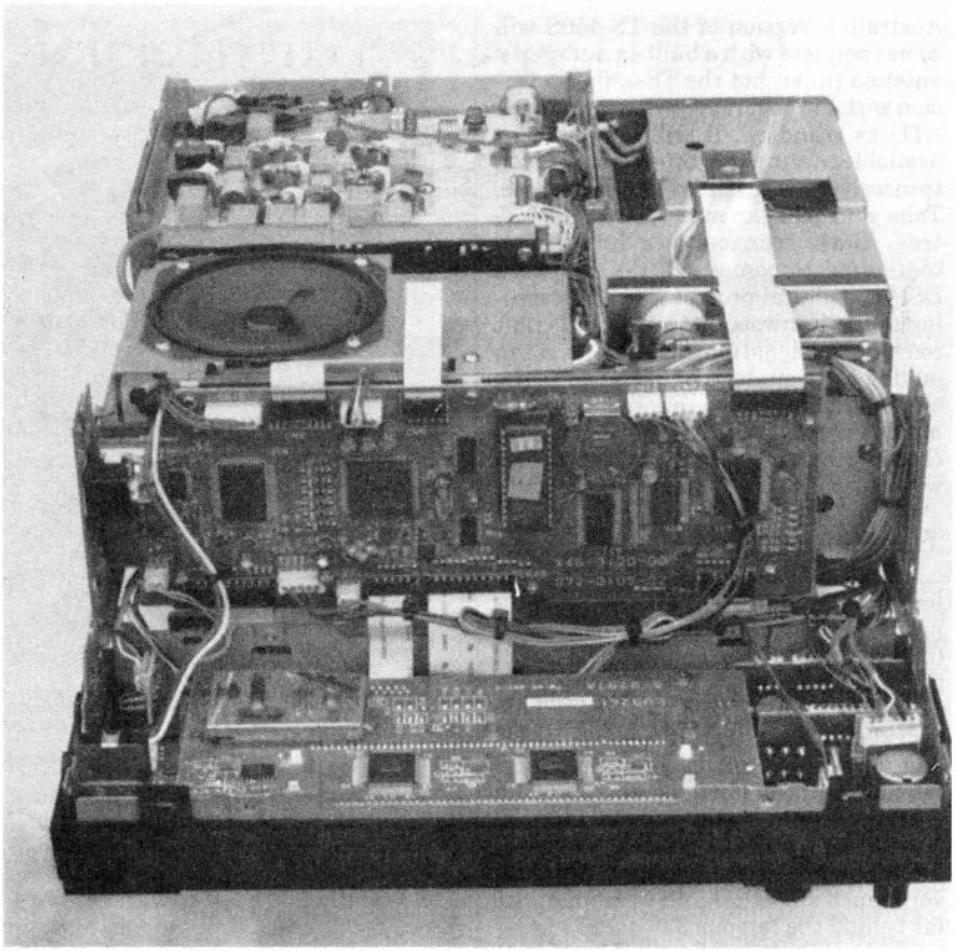
Getting away from old-fashioned CW, those interested in digital modes won't be disappointed with the TS-450. There are dedicated connectors for connection to a RTTY keyboard as well as a TNC to interface with your own computer. Details on how to do this are well covered in the instruction manual.

Finally, the speech processor was tried. The processor used in the 400 series transceivers is a fairly simple audio compressor. It is not as complex or as effective as the RF processors used in the TS-850 or 950 transceivers. Nevertheless, the processor in the TS-450 is very worthwhile. I suggest that it should be used only when working DX under difficult conditions. Local stations might find it a bit too forced. Overall, the transmitter parameters have been well optimised, and the results achieved were very satisfactory.

The TS-450S Optional Accessories

If you want to dress up your TS-450 transceiver, Kenwood has a great range to tempt you. Let's look at them in the order you might need them. Firstly, there are two power supplies, both rated at 20.5 amps output. The standard supply is the PS-33. This will happily run your TS-450, but is not designed for continuous output. The PS-53 is a full output supply, with built-in cooling fan and a full range of protection circuits. The power supplies will not be available in Australia until late 1991 or early 1992.

Of course, the built-in auto antenna tuner, the AT-450, is available as an option for the TS-690. Another ATU, the AT-300, is also offered. I don't know much about this one; it appears to be suitable for mobile operation as it can be mounted externally from the transceiver. Three desk type microphones are available, the MC-85, the MC-80 and, of course, the deluxe MC-60A. I know the MC-60 well, and it is indeed a superb microphone. With luck we might be able to review the other two in one of our mini reviews in the near future.



TS450S with front panel lowered. Auto ATU is on right side.

There are no less than seven optional filters available. For CW operators there are two 500Hz filters, one at 455kHz and one at 8.83MHz. The same system applies to the 250Hz filters.

Two optional SSB filters provide 1.8kHz bandwidth and an additional 2.4kHz filter to tighten up the normal response. Both of these are at 8.83MHz.

To finish off the picture, there is a very nice looking SWR/power meter, a 232 interface unit, the VS-2 voice synthesiser and, of course, the DSP-100 digital signal processor.

The TS-450S Owner's Manual

As is usual these days, the instruction manual is just that. Unfortunately, no technical information at all is presented, apart from a circuit diagram. I feel that a few pages of circuit description would be welcomed by most amateur operators. From the point of view of a purely instruction manual, the TS-450/690 (it covers both models) does a very good job. Not that it is without errors. For instance, on page 27 it tells you to speak into the microphone from a distance of about 5cm (6"). I leave it to you to guess the correct distance. Information on fitting the various accessories is very clearly presented. Overall, not bad, but, with very little effort, could be much better.

The TS-450S Conclusion

There is no doubt that Kenwood has produced a worthy successor to the TS-430/440 line of transceivers. It is good enough to tempt me to sell off my 440 and replace it with the new 450. I don't know. I will need to think about that for a while. Would I recommend it to an amateur looking for a new transceiver? Yes, no doubt about that at all.

There are so many very good aspects about it. The excellent tuning ergonomics, the great receiver performance. The good audio on both transmit and receive. Would I buy the digital processor option? Again I don't know. I would need to be convinced of its worth. I really think that very few will take up the opportunity. Perhaps Kenwood needs to tell us more about it.

Our review transceiver was supplied by Kenwood Electronics Australia, and all enquiries should be forward to it or one of its dealers. **ar**

Transmatch Tuning Noise Bridge

PETER PHILLIPS VK2EPP
18 BRIDGEVIEW CRESCENT
THORNLEIGH 2120

THE NOISE BRIDGE IS A very handy device for those interested in experimenting with different antenna types and associated facilities for matching to the nominal 50 ohm transceiver impedance. The construction of such devices is relatively straightforward and there are many articles on this subject. However, the tricky part comes with the need to calibrate the variable reactive and resistive bridge terminations and to tune out unwanted stray reactance so that the bridge can measure a range of impedances over a wide frequency range with reasonable accuracy.

Some time ago I had the rewarding experience of constructing a variable noise bridge, but I find that I rarely use the instrument to its full capabilities. My main use for the bridge is to check that experimental antennas and associated matching arrangements present a nominal 50 ohm resistive impedance at my transceiver to achieve the desired 1:1 VSWR match. For this purpose, the noise bridge termination is set at the 50 ohm/zero reactance setting and antenna and/or transmatch adjusted to provide bridge balance and hence achieve the much sought after "perfect match" for transceiver operation.

It occurred to me that it would not be difficult to build a simple and compact noise bridge that could perform the above specific task and be left permanently connected between transmatch and transceiver. The bridge is switched in and out of service as shown in diagram 1. This would be of value not only when experimenting, but also in normal HF operation to achieve good antenna/transceiver matching with the minimum of power-up tuning.

Diagram 2 shows the circuit of such device as constructed. Its simplicity lies in the straightforward bridge configuration which requires a 50 ohm internal bridge termination only, and it is compact because the bulky variable resistive and reactive bridge termination arms are eliminated. Other than checking that the bridge can be balanced by a 50 ohm resistive input, no calibration is required.

When the noise bridge is switched into circuit, the antenna or transmatch is connected to the input arm of the bridge balance coil, and the transceiver, in the receive mode, is connected to the bridge noise pick-up coil. When the antenna/transmatch is adjusted to present 50 ohms zero reactance at the input arm this balances the 50 ohms termination on the other side of the bridge balance coil. The noise signal from the noise generator, which is fed into the centre-tap of the bridge balance coil, then divides equally into each arm of the bridge balance coil.

Both arms are terminated in 50 ohms. Hence equal but opposite currents from the noise generator in the bridge balance coil arms result in nominally zero flux in the toroid core and hence minimum signal in the receiver pick-up coil. The bridge is in balance. Variation in output impedance of the antenna or transmatch from 50 ohms will result in bridge unbalance and a net toroid flux, resulting in a signal in the receiver pick-up coil.

Construction

As diagram 2 indicates, the tuning noise bridge circuit may be divided into three sections:

a) The Noise Generator

This is only one of many design types that may be applicable. It basically consists of an amplifier capable of delivering a broadband noise signal over the HF spectrum. The input noise signal is derived from transistor T1 which has its base/emitter inputs connected in a reversed biased mode. T1 collector is not used and left open circuit in this application. (Note: make sure you connect T1 base/emitter as shown in the diagram as this configuration provides the major noise source). The components used in the noise generator are not critical, and resistor/capacitor/transistor types/values may be varied markedly from those shown whilst still providing good performance (ie, this is a good junk box project!).

b) The Bridge Coil

This simply consists of two coils of eight turns of thin solid conductor hook-up or enamelled winding wire wound on opposite sides of a toroid core. One of the coils is centre-tapped to provide the bridge balance coil, while the other forms the noise pick-up coil. The construction of the bridge coil is not critical and various wire types/toroid sizes may be employed, but keep in mind that neat and symmetrical coil windings will enhance the balancing capabilities of the bridge. I also tried winding the coils in a balanced bifilar mode on a small "binocular" core that was obtained from an old 300/75ohm TV antenna transformer. I mention this because some constructors may find toroid cores hard to obtain. In this case, high capacity coupling between the balance and pick-up coils is unavoidable, but the performance of the finished bridge was still reasonably good. To achieve the required 50 ohm bridge termination resistance I used two 100ohm half-watt carbon film resistors in parallel.

c) Input/Output and Switch Circuits

RF input/output for the antenna/transceiver connections were achieved by suitable lengths of flexible 50ohm coax terminated in the normal PL-259 plugs for connection into the (antenna) transmatch and transceiver. The bridge ends of these cables were hardwired directly on to the bridge changeover switch. The bridge switch is used for connecting the transmatch directly to the transceiver for normal operation or inserting the noise bridge in series when measurements are required. A six-pole two-position rotary switch was used for this purpose, with two poles operated in parallel for each side of the RF switching (to ease the load on the individual switch contacts). One of the remaining two poles was used to switch the 12-volt power input on and off.

I have not specified detailed mechanical construction information, as this is relatively simple and may be left to the particular requirements of the individual constructor. However, in my case I employed my normal construction practice of using a piece of scrap laminex as a baseboard and mounting the components through holes drilled in the board as per printed circuit board style. The protruding leads of the components were then cut fairly short and interconnected by lengths of stripped down light duty "rainbow cable". This provides compact wiring and colour coding for ease of circuit tracing. The circuit board, switch and indicator LED mounted comfortably into a small 110x51x70mm aluminium box obtainable from most electronic suppliers. One point to note is that the bridge coil, associated termination resistor(s) and changeover switch should

be mounted so that they provide straightforward and short wiring paths for the RF.

Testing

When constructing equipment I like to test each module of a unit as it is completed, as there is nothing worse than having completed a beautiful looking job only to find that it is necessary to strip it down again to debug it! Accordingly, I suggest that the noise generator be wired up first, visually checked, powered up and connected directly to the antenna input terminal of the transceiver in the receive mode. When the receiver is tuned across all the HF bands a strong random noise signal should be then received of strength at least S9 or higher. Next, wire in the toroid bridge, together with its 50 ohm termination, and connect the bridge pick-up coil to the receiver input, leaving the bridge antenna input open-circuited. Again, a strong noise should appear in the receiver because the bridge is unbalanced. Then connect a 50 ohm resistor between the transmatch input to the bridge and earth. The noise detected at the receiver should then drop to almost zero as the bridge should be in balance and this should be the case on all HF bands. The switch input/output arrangements may then be wired and checked carefully, both visually and with an ohm-meter, and finally connected to the noise bridge module.

Operation

Connection to the antenna, transmatch, transceiver may then be made as per diagram 1. It is probably best to start with the transmatch set at a position where you know that your transceiver gets a good match. Switch the tuning noise bridge to the test position and tune the receiver in normally (with AGC in the fast setting). Then, if necessary, trim the transmatch tuning controls until a distinct dip is detected on both the transceiver S meter and reduction in the noise audio volume. (Note: the dip in noise level should be very distinct at the exact balance point, but some noise may then be heard that is being received normally by the antenna. For this reason it is usually best to check that the band is relatively quiet at the frequency at which you decide to test). If a distinct dip in the random bridge noise cannot be found, this may be an indication that the transmatch range is insufficient to provide a perfect transformation to 50 ohms at the desired frequency. However, assuming a balance point is found, the output of the transmatch should look like 50 ohms resistive and present close to a 1:1 VSWR to the transceiver when the tuning noise bridge is switched to "off" (ie, transmatch then connected directly to the transceiver). You may find, in fact, that on key-down condition of the transceiver, the VSWR is slightly higher than 1:1 because of small practical differences in the nominal 50 ohms impedance as indicated by the tuning bridge or presented by the transceiver. The ideal 1:1 transceiver match may be achieved, if necessary, by further slight tweaking of the transmatch controls under the normal key-down tuning procedure. Exact matching may also vary across a particular HF band, and the noise bridge will be useful in checking such variations before transmission.

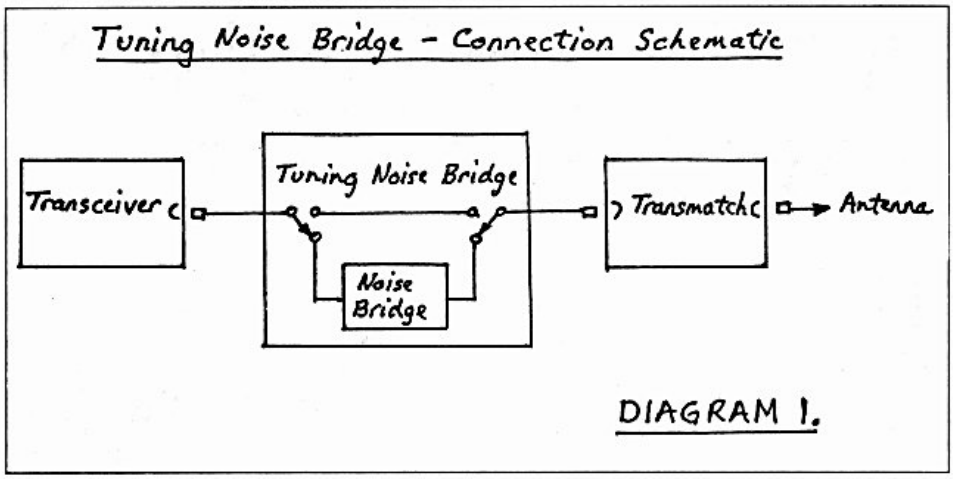


Diagram 1

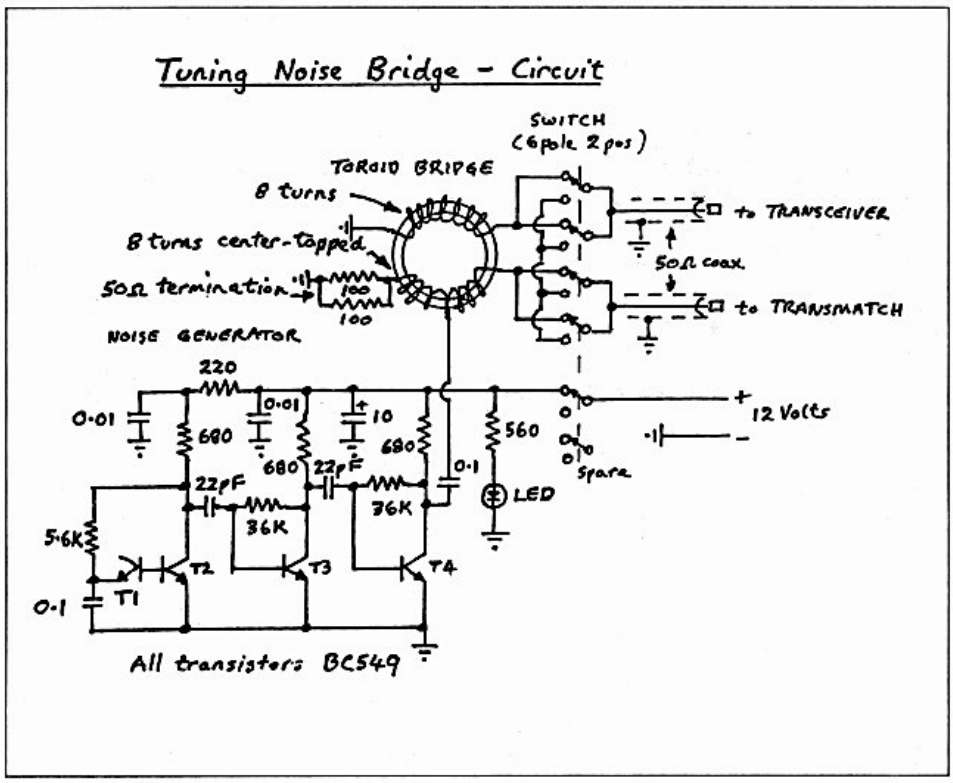


Diagram 2

Caution!

The facility to switch between the tuning bridge and normal transceiver operation may give rise to the situation where transmit power is inadvertently applied to the tuning bridge. To minimise this possibility, the transceiver should be operate in the receive-only position with the power amplifier RF excitation turned down or off when the tuning bridge is in use.

Apart from this potential problem, I think you will find the tuning noise bridge an economical addition to your rig that will make antenna tuning both simple and efficient. **ar**

A TRANSCEIVER FOR EVERY BUDGET

FT-747GX BUDGET H.F. TRANSCEIVER

The FT-747GX is a compact SSB/CW/AM and (optional) FM transceiver providing 100 watts of PEP output on all 1.8-30MHz amateur bands and general coverage reception from 100kHz to 30MHz. Convenience features include a front panel mounted speaker and unobstructed digital display, dual operator selectable tuning steps for each mode, dual VFO's for split frequency operation and 20 memory channels (eighteen of which can store spilt Tx/Rx frequencies). Wideband 6kHz AM, and narrow 500Hz CW IF filters are also fitted as a standard feature. Includes MH-1 hand microphone. See ARA Review — Vol 11, Issue 11.
Cat D-2930

2 YEAR WARRANTY

SAVE $100 **$1199**

Our Most Rugged HF Mobile Transceiver!

FT-757GX II ALL MODE HF TRANSCEIVER

Ready for action! Whether in a demanding H.F. mobile situation, or at home in the shack, the FT-757GX II won't let you down.
Based on its popular predecessor, the new MK2 features the heavy duty die-cast heatsink and rugged metal chassis of the earlier 757GX, but has been substantially upgraded to offer a number of new features. These include...

- All mode operation — SSB, CW, AM, FM(160m-10m)
- 100 watt output on SSB, CW, FM (25W AM) at 100% duty cycle
- High performance general coverage receiver — 150kHz to 30MHz
- Dual VFO's with single button VFO/memory swap functions
- Memories store freq. and mode, plus allow band scanning between adjacent memories
- Inbuilt 600Hz CW IF filter, IF shift and IF notch filters, variable noise blanker, Speech Processor, iambic CW keyer, and SWR meter. Includes MH-1 hand microphone.

Cat D-3492

2 YEAR WARRANTY **$1795**

YAESU

2 YEAR WARRANTY

FT-767GX BASE-STATION MULTIBAND TRANSCEIVER

The FT767GX is the ONLY transceiver that offers such a high level of performance on all HF amateur bands, as well as on the 6m, 2m, and 70cm bands. Features include all amateur band coverage from 1.8 to 440MHz (100W max HF, 10W max VHF/UHF), all mode operation on all bands (SSB, CW AM, FM, FSK), HF receiver covering 100kHz to 30MHZ with up to 104dB dynamic range, inbuilt AC power supply, inbuilt automatic HF antenna tuner, digital wattmeter and auto-calculating SWR meter. Also includes hand-held MH-1 microphone.
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HF, 6M, 2M, 70CM

SAVE $200 **$3495**

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SPECIAL OFFER

PURCHASE ANY OF THESE YAESU HAND-HELDS THIS MONTH AND YOU CAN SAVE $49 ON A SPARE NICAD BATTERY PACK! THAT'S RIGHT, YOU CAN PURCHASE A SPARE FNB-14, 1000mA/H NICAD BATTERY (D-3351) FOR THE SUPER LOW PRICE OF JUST $50 WITH ANY OF THESE YAESU HAND-HELD TRANSCEIVERS. *THAT'S AN INCREDIBLE $49 SAVING!*

FT-411E ENHANCED 2M HAND-HELD

Our best 2m hand-held! The enhanced FT-411E now provides both improved receiver sensitivity and better rejection of out-of-band signals, whilst retaining its compact size (55x155x32mm) and ease of use.

The multi-function back-lit keypad allows fast frequency entry, plus programming of the 49 tuneable memories (and the 10 DTMF memories), setting of the programmable 'power saver' system and a host of other convenient functions.

The microprocessor control system also features 2 VFOs, top mounted rotary dial tuning in 5 selectable tuning steps, a back-lit 6 digit LCD screen with bar-graph PO/S-meter, and a range of scanning features including busy channel, band, or selective memory scanning and priority channel monitoring. VOX (Voice Operated Tx) circuitry is also provided, allowing hands-free operation with the optional YH-2 headset. The FT-411E is supplied with an ultra long-life 7.2 V 1000mAh Nicad battery pack, carry case, belt clip, 'rubber duckie' antenna and approved AC charger.

Cat D-3350

2 YEAR WARRANTY

$449

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10, 12.5, 20 & 25kHz
Supply Voltage:	5.5-15V DC
Output Power:	2.5W @ 7.2V
Current Consumption —	
Stand-by (with 1 sec. save):	7mA
Receive:	150mA
IF. Frequencies:	21.4MHz, 455kHz
Sensitivity (12dB SINAD):	Better than 0.158uV

Ultra Compact

FT-23R 2M HAND-HELD

The FT-23R is an ultra-compact (just 55x139x32mm) microprocessor controlled hand-held transceiver that offers extremely rugged construction and exceptional ease of use. It covers 144-148 MHz and features include 10 memories which store frequency and repeater offset, 6 digit LCD with PO/S-meter, band/memory/priority scanning, 1MHz up/down stepping for fast QSY, repeater reverse operation, selectable tuning/scanning steps, diecast transceiver casing, FNB-10 600mAh NiCad battery pack giving 2.5 watts output and rubber gasket seals around all external controls and connectors. It comes with a mini 'rubber duckie' antenna, carry case, belt clip, and approved AC charger.

Cat D-3490

2 YEAR WARRANTY

Specifications

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10kHz, 1MHz
Supply Voltage:	6-15V DC
Current Consumption—	
Stand-by:	19mA
Receive:	150mA
Sensitivity (12db SINAD):	Better than 0.25uV

SAVE $30

$369

YAESU

2m & 70cm In One!

FT-470 DUAL-BAND HAND-HELD

Dual-band performance at its best! The FT-470 is a very easy to use hand-held transceiver that offers a high degree of flexibility through the use of a sensible multi-tasking microprocessor control system to provide both 2m and 70cm operation in one compact unit.

Dual independent IF circuits allow several functions to be performed simultaneously, including dual-band reception, and full cross-band operation. The FT-470 also has 21 tuneable memories and 2 VFOs per band, plus inbuilt C.T.C.S.S. (tone squelch) with a paging facility and a wide variety of scanning functions. A back-lit LCD screen shows a 5.5 digit frequency display on both bands simultaneously and a bargraph PO/S-meter lets you know exactly what you're doing. A programmable 'power-saver' system helps maximise battery life, allowing squelched receive current of as low as 7mA. The FT-470 comes with an ultra-high capacity 7.2V 1000mAh NiCad battery pack, carry case, belt-clip, dual band antenna and approved AC charger.

Cat D-3360

2 YEAR WARRANTY **$699**

Specifications

Frequency Coverage:	144-148MHz, 430-450MHz
Output Power:	2.3W (both bands, 7.2V)
Supply Voltage:	5.5 to 15V DC
Current Consumption—	
Stand-by (with 1 sec. save):	8mA (each band)
Receive:	150mA (each band)
Sensitivity(12dB SINAD):	better than 0.158uV (both bands)
Size:	55 x 180 x 32mm

DICK SMITH ELECTRONICS

YAESU FT-1000

YAESU

"The Best of the Best!"... That's what Yaesu and Dick Smith Electronics think of the FT-1000 deluxe HF all-mode transceiver. But don't believe us- read what the experts have to say...

On documentation

"clearly written and complete, and includes a complete set of schematics and many high quality photos" — QST "The quality of printing and presentation of this book is the best I have seen..." — AR

On operation

"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the Icom IC-781 or the Kenwood TS-950S." — ARA "...I found the FT-1000 easier to learn and use than any other radio in its class." — QST

On the receiver

"On receive, the performance was often beyond the limit of the latest professional measuring equipment, with no measurable trace whatsoever of synthesizer phase noise." — PW "...this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." — QST* "The direct digital synthesizer works very well and produces receiver performance that sets new standards." — AR "I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation on all bands." — ARA

Transmitter — SSB

"In SSB operation, the FT-1000 is easy to adjust and use... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." — QST "Reports were all very favourable, especially when using the speech processor." — AR "...reports of my transmitted audio were very good, even with the RF processor turned up..." — PW

Transmitter — CW

"CW keying was a delight...power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." — AR "On CW the FT-1000 was absolutely faultless." — ARA "CW operation with the internal keyer is a breeze... In QSK CW operation, the rig has well shaped and weighted keying." — QST

Transmitter — RTTY/Packet

"Using the set on HF packet was an absolute pleasure..." — PW "RTTY and packet radio operation with the '1000 are straight forward..." — QST "Packet and RTTY modes were tried and proved just superb." — ARA

Conclusion

"Yaesu's latest 'Flagship' transceiver clearly lives up to its name..." — PW "...the FT-1000 represents unbeatable value..." — AR "It is an excellent set worthy of accolades and rave." — ARA "...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." — QST*

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver, and easy to use controls put it far ahead of the competition. Wouldn't you rather be using the "Best of the Best"?

Cat D-3200

2 YEAR WARRANTY

$4995

including MD-1 desk mic

Magazines

ARA — Amateur Radio Action Vol. 13, No. 2
AR — Amateur Radio August 1990
PW — Practical Wireless January 1990
QST — ARRL QST March 1991 *(review with optional filters fitted)
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Serious Amateurs Deal With The Professionals

VHF/UHF BASE STATION ANTENNAS

These high quality, vertically polarised base station antennas are ideal for the discerning Amateur operating on the 2m, 70cm or 23cm bands. They're beautifully constructed Diamond brand antennas from Japan and provide high gain for maximum range. Constructed from robust F.R.P. tubing for excellent all-weather operation, with ground-plane radials for a clean radiation pattern.

2m ANTENNA F23A

Frequency: 144 —148MHz
Gain: 7.8dB
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 4.53m
Type: 3 x 5/8 λco-linear
Cat D-4850

$199

2m/70cm ANTENNA X-200A

Frequency: 144 — 148MHz, 430 — 450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Max. Wind Speed: 180km/h
Length: 2.5m
Type: 2 x 5/8 λ(2m), 4 x 5/8 λ(70cm)
Cat D-4860

$199

23cm ANTENNA F-1230A

Frequency: 1260 — 1300MHz
Gain: 13.5dBi
Max. Power: 100W
Max. Wind Speed: 144km/h
Length: 3.06m
Type: 25 x 1/2 λco-linear
Cat D-4870

Limited Stocks!

$249

2m 1/2 WAVE BASE STATION ANTENNA

An outstanding value for money, compact, Australian made base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection and comes with a 5 year warranty.

Cat D-4820

—MOBILE ONE

$49.95

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CONTESTS

(INFORMATION PROVIDED BY THE RELEVANT CONTEST MANAGERS)

John Moyle Memorial Field Day Contest 1991 Results

PHILIP RAYNER VK1PJ
JOHN MOYLE CONTEST MANAGER

Results of the John Moyle Memorial Field Day Contest held on the weekend of 16-17 March 1991 have now been compiled. On behalf of the WIA, congratulations are extended to the winners in each section. Commiserations to those who made contacts but did not enter their log.

In the following list of logs received, an asterisk indicates the winners of certificates:

Results

24-Hour Home Station, Multi Op, Phone, All Band

VK4SEA	350

24-Hour Home Station, Single Op, Phone, HF

VK3CAY	108
VK4QI	89
VK3ENX	43

24-Hour Home Station, Single Op, Phone, All Band

VK4SSB	600
VK3DD	141
VK5ATQ	32
VK4EV	26

24-Hour Portable Station, Multi Op, Open HF

VK6PM	130*

24-Hour Portable Station, Multi Op, Open, All Band

VK6ANC	2164*
VK4WIS	1854
VK5ARC	1036
VK4WIT	598

24-Hour Portable Station, Multi Op, Phone, HF

VK4CHB	840*
VK2WO	654
VK4WIR	146

24-Hour Portable Station, Multi Op, Phone, All Band

VK4WIE	4168*
VK4IZ	3810
VK1ACA	3512
VK3ATL	3056
VK3ANR	1476
VK3GH	1470
VK3BCG	1074
VK3BML	924
VK2FFG	856
VK3BEZ	660
VK2APW	500
VK1ZX	348
VK5BP	280

24-Hour Portable Station, Single Op, Open, HF

VK4OR	560*
VK3CFI	88

24-Hour Portable Station, Single Op, Phone, HF

VK5CN	366*

24-Hour Portable Station, Single Op, Phone, All Band

VK4IY	570*
VK4MCY	534
VK5ABS	272
VK4VR	150
VK6JIP	44

24-Hour Portable Station, Single Op, Phone, VHF/UHF

VK2EZF	514*
VK4ZXZ	148
VK4RX	70
VK4BAW	52
VK4ANN	42
VK4GUY	28
VK4KAC	24

6-Hour Home Station, Single Op, Open, HF

VK3AOR	142

6-Hour Home Station, Single Op, Phone, HF

VK1KRC	195

6-Hour Portable Station, Multi Op, Open, All Band

VK4WIN	524*
VK5BAR	264

6-Hour Portable Station, Multi Op, Phone, HF

VK2CKB	208*
VK4WIW	196
VK4WIM	128
VK5LZ	80

6-Hour Portable Station, Single Op, CW, HF

VK3EFO	32* Trophy

6-Hour Portable Station, Single Op, Open, HF

VK2EL	84*

6-Hour Portable Station, Single Op, Phone, HF

VK4YB	518*
VK3OM	76
VK6BEB	26

6-Hour Portable Station, Single Op, Phone, All Band

VK5GN	532*
VK3HZ	290
VK4AIZ	290
VK4ACL	236

6-Hour Portable Station, Single Op, Phone, VHF/UHF

VK2DXV	226*
VK4ZWB	6

Six-Hour Home Station, Receiving, Phone, HF

William Yates 113
Check Log VK4OD

Operators' Comments

VK1ZX - While you will not get two hams to agree on the rules, you must have had some measure of success for it seemed to me that there was a greater number of field stations active than in the past couple of years.

VK2WO - A good time was had by all; however, did not enter morse CW section as there was insufficient loading on points for CW contacts to make this viable - something to look at for next year. *(See comments about CW)*

VK3AOR - New rules should encourage participation by more multi-op portable stations - a good move. Next year, I'll be out there; generator blown up this year.

VK3CFI - I wish I had entered the ALL bands section. I managed to contact both U2MIR and U9MIR on two-watts output with handheld transceiver and rubber duck antenna. At 2000km they would have given me 30 points each. *(But, were they portable?)*

VK3ENX I realise that my score is very low, but this is the first contest I have had the confidence to enter. My feelings now are that contests are great fun and I will certainly be involved next year. *(Congratulations, glad that you tried another aspect of the hobby)*

VK4IZ - Had a really fun time as always and a great way to introduce those doing classes to amateur radio.

VK4OR - An enjoyable contest and camping time. Delightful weather. At 11am on Sunday, almost all the club stations had done their 24 hours and disappeared. The bands went very dead. I had a lot of trouble getting QSOs in the last hour (I started just after midday on Saturday). I don't know how the late-comers got on who were going to do a six-hour burst, because they would miss out on all the club portable stations. Perhaps there weren't any doing it. *(What about contest period being 0200 Saturday to 0159 Sunday?)*

VK4WIR - I feel that this contest was much friendlier than previous years. No bonus points for solar power etc helps even out the scores.

VK5ABS - As the contest is to test how efficient the equipment is, contacts only allowable by field stations should be other field stations.

VK5ATQ - Good fun; first contest for many years for me. Did not plan on entering, just heard some calls and gave replies. Heard some VK3s on 2m SSB, so must develop some better gear for next year.

Contest Manager's Comments

I would like to explain what I consider the purpose of this contest. As the aim states, the contest is intended to help amateurs to become familiar with portable operation and thus assist in training them for emergency situations. I compare the JM to a communications exercise where a central control station, namely the multi-operator or club station, has access to all modes and bands of operation to control and provide a communication path between single operator stations on any one band or mode who may be co-located with emergency service field staff.

I have said that the rules as printed in January 1991 *AR* should not be changed for at least three years so that continuity would exist and entrants would know where they were. Unfortunately, a few queries were raised and, therefore, the rules may need fine tuning and I would like to explain what the queries were and where the changes may be required. Comments on these rule changes would be appreciated.

How is massive logistic support assessed?

In our hobby, support can be provided to a station without the support being physically present. By example, what can be termed massive logistic support from afar is where one operator uses a club callsign and upwards of 13 club members and friends operate from another site more than 150 kilometres away on VHF and UHF, thus obtaining 30 points for each contact. The members like clockwork contact their own club call in an obviously biased manner. This can only be seen as providing massive logistic support. A club which operated in this manner has now withdrawn its entry, much to my satisfaction, as a complaint was received from another contestant of which follow-up investigation confirmed the unspirited and biased operation. Whilst the supporting members' entries could have been disqualified, I have left them in, but have subtracted the points for which they had contacted the club callsign.

You may also say that assistance with the setting up of a single operator could be classed as massive logistic support. My idea of allowing this was to assist the inexperienced, elderly or incapacitated to join in and be portable in the contest. The JM could also encourage other family members and friends to assist with antenna raising, log keeping, food and drink making. This would not alienate them and may encourage their participation in our hobby.

The rule change to overcome the above problem would be to make multiple operator entrants use all mode, all band and be portable.

This would then raise the problem of the next query being that a multi-operator station which entered the HF section did not make any CW contacts as there was insufficient loading on points for CW contacts to make it viable. Maybe where a station enters the open mode section and works CW then those contacts on CW should be higher than those worked on SSB. I think that a rider should be added to ensure that there is a certain percentage of contacts made on CW for this to function properly. We must remember that we cannot compare a station working only CW to a station working only SSB, as these two stations are not competing with each other, therefore there is no reason why the station working CW should be given higher points. You tell me what you want!

Lack of VK CW activity - there were heaps of VK CW operators in the Commonwealth Test last week.

Maybe encouraging the family to assist and take an interest in contests would allow operators to work both contests on consecutive weekends.

Why can't the repeat time of working ZL stations be the same, ie hourly?

Unless the ZLs also work the 20, 15 and 10m bands, which is most unlikely, hourly repeats give the eastern states an unfair advantage over the western states. While the eastern states can contact ZLs easily on 80 and 40m, the VK6s cannot hear them. The three-hourly repeat contact rule was added to allow far more operation for all entrants. Please keep in mind that the repeat time starts from the last **valid** contact which may not necessarily be the very last contact you made with that station.

There seems to be some misunderstanding regarding operators from multi-operator stations, when not on duty, contacting the multi-operator stations under their own callsign.

I liken this type of activity to a member of a relay race helping a teammate to the next handover point. If one was to do this in any other sport of activity unless actually stated that it **was** permitted, the whole team would be disqualified. Surely I do not have to spell it out for you. This year all points for such contacts were deducted from the multi-operator stations' points.

I would appreciate any further comments you have regarding the above points raised, or any you may feel need attention. Thank you for being part of the 1991 John Moyle contest. See you all next year. **ar**

Magazine Review

D-I-Y Radio

Christine Russell

RSGB has published a new amateur radio magazine for beginners of all ages called *D-I-Y- Radio.*

A construction guide, including diagrams of the circuit and construction of the key, is given for a morse key and buzzer. I would think this is a good start in learning practical construction techniques; even a novice candidate like myself could understand and follow it.

Hints and Tips on Soldering: I read this article and the step by step instructions made it seem so easy I'm going to have to try this soldering caper myself.

A comprehensive "how to" for Amateur Radio Direction Finding (Fox Hunt). Quite interesting. I've heard of fox hunting, but I wasn't sure how you would find the hidden transmitters. Easy for all ages to understand. No technical overload involved.

Readers from a wide age spectrum are excited about this magazine as I discovered after reading "Letters to the Editor".

This is an ideal magazine for children too, with a free poster included entitled "Amateur Radio - The Space Age Hobby".

ar

Murphy's Corner

Errata August Issue

Just when we thought he was firmly under control, Murphy decided to strike back with a vengeance. His selected victim was Clive Cooke VK4CC, whose interesting VK Caltenna article was corrupted.

In the first place we misspelt Clive's surname - leaving the 'e' off the end.

In figures 1 and 2, the captions are correct, but the figures themselves have been transposed. Of the four circuit diagrams, all except that presented as figure 1 have had their coaxial connections transposed. The centre conductor in these three diagrams should each be connected to the winding centre tap.

The formula halfway down column 1 P 10, shown as $A=B*C$ should have read $A=\sqrt{(B*C)}$.

On the top of column 2, page 9, the bandwidth should have been 500kHz, not 50 as shown. Same page, top of column 3 - the impedance of free space should have read 120π ohms.

Apologies to Clive for these unfortunate errors.

ar

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO BOX 169, MENINGIE 5264

All times are UTC

Six-Metre Beacons

Freq	Callsign	Location	Grid Square
50.000	GB3BUX	England	I073
50.005	H44HIR	Honiara	QI00
50.005	HL9TG	Korea	PM37
50.005	ZS2SIX	South Africa	KF25
50.011	JA2IGY	Japan	PM84
50.015	SZ2DH	Greece	KM18
50.017	JA6YBR	Japan	PM51
50.020	GB3SIX	England	IO73
50.020	CX1CCC	Uruguay	
50.025	6Y5RC	Jamaica	FK17
50.025	OH1VR	Finland	KP12
50.027	9H1SIX	Malta	JM75
50.028	JA7ZMA	Japan	QM07
50.029	CT0WW	Portugal	IN61
50.032	ZD8VHF	Ascension Island	II22
50.032	ZS5SIX	South Africa	KG50
50.035	ZB2VHF	Gibraltar	IM76
50.035	ZS3VHF	South Africa	JG87
50.035	V73AT	Marshall Is	RJ38
50.039	FY7THF	French Guyana	GJ35
50.041	FO5DR	Tahiti	BH52
50.045	OX3VHF	Greenland	GP60
50.048	TG4BFK	Guatemala	
50.050	GB3NHQ	England	IO91
50.050	ZS6DN	South Africa	KG44
50.051	LA7SIX	Norway	JP99
50.054	VK3SIX	Hamilton	QF02
50.056	VK8VF	Darwin	PH57
50.057	TF3SIX	Iceland	HP94
50.062	PY2AA	Brazil	GG66
50.064	WD7Z	Arizona	EL59
50.065	GJ4HXJ	England	IN89
50.065	NB30/1	Rhode Island	FN41
50.066	VK4RPH	Perth	OF78
50.063	KH6HI	Hawaii	BL01
50.075	VS6SIX	Hong Kong	OL72
50.078	TI2NA	Costa Rica	EK70
50.080	KH6JJK	Hawaii	BL11
50.080	HC8SIX	Galapagos Is	EI59
50.080	SK6SIX	Sweden	JO57
50.086	VP2MO	Montserrat	FK86
50.088	VE1SIX	Canada	FN65
50.090	KJ6BZ	Johnston Island	AK56
50.091	9L1US	Sierra Leone	IJ38
50.092	W5GTP	Louisiana USA	EM40
50.099	KP4EKG	Puerto Rico	FK68
50.100	HC2FG	Ecuador	FI07
50.100	5H1HK	Tanzania	
50.110	KG6DX	Guam	QK23
50.110	A61XL	Un Arab Emir	LL74
50 120	4S7EA	Sri Lanka	MJ97
50.321	ZS5SIX	South Africa	KG50
50.490	JG1ZGW	Tokyo	PM95
50.499	5B4CY	Cyprus	KM54
51.020	ZL1UHF	Auckland	RF73
52.100	ZK2SIX	Niue	AH50
52.200	VK8VF	Darwin	PH57
52.310	ZL3MHF	Christchurch	RE66
52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.465	VK6RTW	Albany	OF84
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
52.510	ZL2MHF	Mount Climie	RE78

Frank Sleep VK4CAU advises that the Rockhampton beacon on 432.540 is not operational at present.

Peter VK3AWY reports that the Geelong six and two-metre beacons are being shifted to Mount Anakie QF22, the site of the 2m and 70cm repeaters. They should be operational by the time this is read. Both beacons will have their callsigns changed from VK3RGG to VK3RGL, thus all amateur equipment on Mount Anakie will have a common callsign.

Ron VK4BRG writes that 3D2 is considering a 6m beacon, to the extent that a callsign has been allocated.

A correction to the August Six Metres Standings List. Steve VK3OT is shown as having worked 81 countries. This should read 79 - my error!

Six Metres

Six metres has been quite with the occasional winter Es opening to VK2 and VK4 and TEP to Japan.

However, on 26/7 Steve VK3OT noted much TV activity below 50MHz at the same time as an opening to Japan. This was passed on to Peter VK8ZLX, who subsequently called CQ and, at 0914, was answered by BY4YB in China! Signal reports of 5x5 each way were exchanged. Peter says that information from JG2BRI indicates that there are three stations licensed in Taiwan, BV2DP, BV2WA/1, JP1AIW/BV1 and huge dogpiles from all JA districts have been working the BV stations via Es.

Sarina Reports

Ron VK4BRG reports 6m as being relatively quiet. He heard nothing of the Mongolian DXpedition, but did hear the KC6MR beacon on 14/6 at 0052. Despite an S9 signal, Ron was unable to make contact. 24/5: 2215 FK8EB weak scatter; 31/5, 1/6: 2357 V73AT. 4/6: 0803 KH6IAA, 0811 KH6HH, 0902 KH6JEB/KH7 - with digital voice CQ machine on 50.120; 8/6: 2310 KG6DX; 10/6: 0200 to 0530 - extensive Es and working VK1 to VK8 and ZL. VK2ZXC reported working VK9YQS and FK8EB. 13/6: 2155 ZL1BHV via scatter, 2157 3D2PO direct either F2 or Es, 2204 ZL2TPY via weak scatter; 15/6: 0818 NI6E/KH6 via TEP; 16/6: 0508 to 0526 ZL2TIC, ZL3ADT, ZL3TY, 0757 KH6IAA, 0841 NI6E/KH7.

Tasmania

We hear little from Tasmania, so thanks to Maurice VK7SA for letting us know a little of 6m. 20/4: VK7ZMF and VK7ZBA worked W5GVE at 2384; 21/4: VK7ZMF worked XE1GRR and XE1GE at 2342; 28/4: VK7SA and other VK7s worked P29PL and P29ZGD at 0005, 0047 to 3D2CM, from 0245 good JA opening to all districts; 29/4: Good JA Opening to VK7s, RR, ZIF, JWR, SA and others. Little else to report.

From the UK

Ken Ellis G5KW reports from his column in *HRT* magazine that Max IK8HIO is active as IG9/IK8HIO in JM65. QSL via IK8IUT.

CE8ABF has promised to run a keyer on 50.007 when the band is quiet.

Lucien FM5WD on Martinique requests that 6m QSLs should be sent to him direct.

Steve ZB0X from Gibraltar is active on 6m.

George Galea on Malta was 9H5AA but is now 9H1AA.

A new beacon UL8GDD, has been activated from within the USSR, with five watts on 50.055, locator MN83. However, Ken G5KW questions the legality of this station.

The Norwegian beacon LA7SIX on 50.050 runs 25 watts to a four-element Yagi beaming 190 degrees.

As at 31/5/91 no 6m permits have been issued in EA, YU or SP, despite a number being active on 6m.

Recently, YO2IS in Romania managed to assemble a 6m station from junk parts, and in a short period had worked more than 30 countries!

Mongolia

It all started when Ray VK3LK called CQ at 0830 on 3/6 and was answered by JA1OEM who asked him to QSY from 50.110.

Steve VK3OT was listening and called JU1JA (the Mongolian DXpedition) on 50.150, who had previously reported hearing the VK3SIX beacon between 0105 and 0130. The DXpedition was supposed to call on 50.125, but nothing heard. It transpires that the split operation was 50.115 to 50.165. Steve remarked, "Oh well, you've got to try and sometimes you make it. But at least the beacon was heard in Mongolia."

All is not lost because JA1MVK has donated a 6m rig to JT1CO who will be a permanent operator from Ulan Bator.

DXCC from G-Land

G5KW has sent a copy of the RSGB 50MHz

Countries Award for 100 confirmed countries by Geoff Brown GJ4ICD. This is award number one and is dated 31 July 1990.

On the same subject there is an interesting paragraph from Steve VK3OT in July *ARA*, and reproduced with his permission:

"The following list shows the invalid stations for DXCC - EA, EA8, YU, EA9, 3X1, Y22, HA, OK, EA6, SV9, SV5, 4X4, YV0 and now DL.

"To work 100 countries you can get these, all worked this cycle in Europe. A22, CE, CO, CN, CT1, CT3, CU CX, C5, DL, DU, D44, EI, EL, F, FP, FR, FY, G, GJ, GM, GU, GW, HB9, HB0, HC, HC8, HH, HI, HZ, HK, HP, HR, HV, I, IS0, IT9, JA, J37, J52, KG6, KG4, KP2, LA, LU, LX, OA, OE, OH, OH0M, ON, OX, OY, OZ, PA, PJ9, PZ, P43, SM, SV, TF, TI, TK, TR, TU, T77, VE, VK, VP2E, VP2V, VP5, VP9, VS6, V29, V31, V47, W, YN, YO, YV, ZB, ZC4, ZD8, ZF, ZS, V51, Z23, PY0, 1A0, 3DA, 4U1, 5B4, 5H1, 5NO, 6W1, 7Q7, 7X, 8P6, 8R1, 9H, 9J2, 9L1, 9Q5, 9Y4, 8Q7, C6 and ZS9.

"So, don't despair - there's hope for us yet!"

Walvis Bay

An interesting snare for a limited number of VK stations was ZS9A in Walvis Bay on 19/4 around 0740. This is a tiny country right on the west coast of Africa and adjacent to Namibia, and was available during one of the openings to southern Africa. I think it was a surprise for those involved to find that it was a separate country.

On Higher Bands

On the Adelaide scene, in particular, there has been a flurry of activity to upgrade equipment and antennas on 432MHz. The K1FO version of the Yagi has been singularly successful in improving results for some stations. VK5LP found it to be even better than the former gold-plated 16-element KLM which saw many years service!

The next obvious step was 1296MHz and currently stations operating around Adelaide are VK5s KK, AKM, AKK, ZLJ, EME, KEV, QR and LP. Those capable of operating on either FM or SSB, but not being heard, include VK5s HY, KRW, ZRO, AVQ, AGG, WA, AIM, ZDV, ZAV, ZRG and ZMJ. VK5RO is showing an interest! VK5EME is Mark, formerly VK5ZMK.

On 2304MHz are to be found VK5KK and VK5AKM, each with 23-element loop Yagis - they were the first of the group to try the band; VK5EME and VK5ZLJ use 52-element loop Yagis, which are an upgrade from the original "Figure 8" solid state antennas. Each station runs about half a watt with spectacular results.

VK5KK and VK5AKM tried the band some time ago with limited results. The present activity commenced on 9/7 with marginal signals between VK5AKM and VK5EME over a 30km path. On 11/7 VK5EME came on with his 52-element loop Yagi and was immediately received by VK5AKM at 5x4. At the same time David VK5KK operated portable from Houghton in the Adelaide hills, and 5x9 signals both ways were exchanged with Keith VK5AKM and Mark VK5EME. However, from his less than helpful home QTH David could only manage 5x1 with VK5EME.

With gradual upgrading of equipment signals improved so that extended tests between VK5EME and VK5AKM saw signals at 5x4 on 14/7, 5x6 on 15/7 and 5x9 on 16/7 and 17/7, but still 5x1 to VK5KK. Ron VK5ZLJ now joined the scene and exchanged 5x9 signals with VK5AKM on 16, 17, 18, 19, 20 and 21/7 over a 60km path. At times the signals were peaking to 50dB over S9! All this with half a watt! Signals on 1296 around the same times were usually 5x9. Mark VK5EME suggested that there are periods of obvious enhancement assisting 2304MHz, as signals under more normal conditions usually average around 5x8. Signals have been mostly SSB, but FM has been tried with similar results.

All the above activity means that when conditions are right, Wally VK6WG in Albany, that doyen of UHF operating, may suddenly find a dogpile on 2304MHz. It will be interesting to see what happens around the end of January when conditions generally favour UHF operating.

On 3456MHz SSB can be found VK5QR, VK5KK and VK5AKM with VK5NY in the future.

Much credit for the sudden interest in SSB on 2304 and 3456MHz is due to the efforts of David VK5KK, who has prepared a series of kits which can be readily assembled and apparently proving very popular.

ATV on 10GHz

From Rockhampton, Frank Sleep VK4CAU writes to say he has been encouraged by results with ATV on 10GHz, with displays being given at local schools during hobby festivals and fetes.

The recent purchase of a colour 12-volt camera has allowed freedom from mains power and thus to extend the range from the usual 10 to 20 metres to 100 metres at a recent display at the Rockhampton High School. Liaison between the camera/transmitter and the television was by the sound channel on the TV, one way and two metres the other. The IF used was Channel 4 on the TV (about 98MHz) with the RF being fed directly into the TV. No FM to AM conversion was used; the "slope detection" by the TV produced excellent results, as per the Gunnplexer Cook Book, written by Bob Richardson W4UCH.

Frank will try some pre-emphasis to the video in an effort to produce even better results. Future experiments on 10GHz will be into NBFM with five to 15kHz deviation. Thanks for the news, Frank.

Aircraft Enhancement

This form of propagation continues to draw its loyal band of followers. Roger VK3XRS from Sarsfield, about four kilometres north of Bairnsdale and 240 kilometres east of Melbourne, reports that on 31/5 on 144.200 he worked VK1BG and VK1VP; 1/6: VK1VP, VK1BG, VK1AU plus VK1BG (432.200). 14/6: VK2ZAB and VK1VP (432). 15/6: VK1AU, VK1BG. 21/28/6: VK1AU, VK1BG, 29/6: VK1AU and heard VK2ZAB, VK3UM, VK3DUT, VK3AUG, VK3AFW, VK2ZRE, VK1VP. Times are between 2210 and 2240.

Included in the log for normal working were VK3AUG on 144 on 31/5; VK3ZJC on 432 on 16/6 and FM carriers heard both ways on 1296; 22/6 VK3KSD on 144; 3/7 Andrew VK7ZHA on 144 and 432 at 5x9 both ways on SSB and FM.

Roger works Andrew most mornings of the week around 2215 on SSB with signals to 5x9; Andrew about the same time usually works Ron VK3AFW on CW.

Roger VK3XRS says his 1296MHz station is taking shape with the installation of a 2C39 water-cooled cavity and the reaction of a 2m-diameter dish. Contacts this year have been made with VK3ZBJ, VK3YTV, VK3ZJC, VK3KKW, VK3BBU and VK7ZAP. On 432MHz he was pleased to have a contact with Wally VK6WG in Albany on 31/3 with signals 5x6 and a path distance on 2 671.8km. Roger uses a DL6WU 34-element Yagi on a 9m boom, Yaesu 726R and 130 watt linear plus GaAs FET pre-amplifier.

Late Items

Noticed in the Japanese "CQ ham radio" (courtesy VK6RO) a reproduced QSL to JR6WPT from TL8MB in the Central African Republic of Bangul. This could be a nice catch for a lucky VK station browsing around six metres!

It has been tentatively reported that the PNG beacon P29BPL is now on 50.020. In April it was still being reported as heard in Japan on 52.012, but it has not been heard in VK5 for a long time.

This month's information is a bit "chop and change" but has covered a variety of subjects. I decided against mulling over somewhat dated 6m contacts - that band has been given plenty of mileage lately.

Closure

The spring equinox will soon be here. Keep in mind to look predominantly towards the east from the early mornings (local time), northwards later in the day, west to Africa from late afternoon, and to Europe from early evening. JAs will be around at odd hours right through to midnight local time!

Two thoughts for the month: "Sport is the toy department of the human life" and "If you think nobody cares if you're alive, try missing a couple of car payments"!

73 from The Voice by the Lake

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HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93, DURAL 2158

Somebody once said that the age of the amateur DX operator shows immediately when he or she starts using the phonetic alphabet for the callsigns or for spelling difficult words. Among the new generation DXers, there are some who do not use phonetics at all, relying completely on the pronunciation of the letters and believing that the rest of the world (90%), whose native language is not English, will understand them. There are others who, for some psychological reasons, want to be smart, flamboyant, clever(?) - call it what you will - who use phonetics like: big sugar daddy for the letters: BSD, or similar absurdities. Do you really believe that such poor operating skill does enhance our image in the eyes of our fellow amateurs who are not DXers? Among the generations of the post-war amateurs, some still use the phonetics of the names of various countries as recommended in the 1944 edition of the *RSGB Amateur Radio Handbook*, page 280, or use the system of various first names as they appear in the *1950 ARRL Amateur Handbook*, page 525. I know of a well-known DXer who is always deaf when the callsigns are not spelled out phonetically in the correct way. So, let's make a resolution: you and I and all the other DXers: use the phonetic alphabet as recommended by the ITU radio regulations, in which the "W" is whisky, not William.

Albania - ZA

For the past 12 months the possibility of a DXpedition to Albania was a constant on-again off-again affair. The possibility of such an expedition was somehow always connected with Hungarian radio amateurs. The first news about - yet again - a new group spread on the various nets on 28 July. Janos HA0NNN, Istvan HA0DU and Gyozo HO0MM will operate from ZA. The first pirates appeared at the same time, signing a variety of combinations of a future call. Hearing the news, I immediately telephoned my sources in Hungary, and it was confirmed from there that the news was correct. This is the picture: The DXpedition is a private enterprise action, not the one which is still in the melting pot by the Hungarian and Albanian radio amateur societies. The expedition is connected with a church welfare relief mission group going to Albania from Hungary. The intending DXpeditioners promised to help the welfare group financially, and hope that in return the respective authorities will allow them to operate. At the time of writing this, at the end of the first week in August, they are supposed to be on the bands and intend to operate for 15 days. They will use the usual DX frequencies, and will operate CW, SSB and possibly RTTY.

There will be computer logging which will prevent duplicates, including crossband, and they ask the DXers not to make "insurance" contacts. The expeditioners are eager to receive donations, but only after "the job has been done". So, if you worked them and you are sure about their identity, then send your card and your donation to: Quick Aid Foundation, PO Box 5, Komoro 4622, Hungary. Cross your fingers and hope to beat the dogpile.

Pagalu (Annabon) Island - 3C0CW

August was a bumper month for new DX contacts. As reported briefly in July *AR*, EA3CUU and the Radio Club of Garrotxa (Spain) were arranging a DXpedition to this remote island off the west coast of Africa, 1°5' south latitude and 5°6' east longitude, sunrise is at 0538 and sunset at 1740. It was announced by EA3CWK at the beginning of August that the 10-day expedition will start 5 August on the usual CW, SSB, DX frequencies, including the WARC bands. They also promised to be on at least two international DX nets. Hope for the best.

St Paul's Rock - CY9CWI

This operation was a short one (see July *AR)* from 2-7 August. Whilst they had a strong signal to VK and ZL, it was very difficult to overcome the signal of the North Americans who worked them constantly. QSL to club station: VE2CWI.

Afghanistan - YA - T6AS

The Italian DXpedition to Afghanistan became a reality, not on 12 July as planned, but some days later. They were very active, and had a strong signal to VK on the shortpath on 21 July on CW for only short periods. It was difficult to work them with 100 watts and average beam from here; however, the European stations had a ball. According to various sources, they were ordered out of the country on 22 July. QSL to: IT9ASZ - Dr Salvatore Alescio, via Corso La Masa 67, I-90019 Trabia PA, Italy.

South Sandwich Islands - VP8

Last month I was happy to report to you that the DXpedition is on target to commence on 5 November. This month brings the sad news from AA6BB that the expedition has been delayed until 2 or 9 March next year. The scientific members of the expedition and the captain of the ship believe that the ice surrounding the island will be much friendlier in March next year.

DX on 160 and 80 Metres

If you listen on the 160m band late in the evenings, VK2 local time, you will find a small group of "top band" DX enthusiasts active on the upper edge of the DX portion of the band. Roger VK4YB has sent me a note about the activities of this small group. The 160m band is still able to provide reliable DX, despite the peak of the sunspot cycle and recent solar activity - writes Roger. The SEANCE net - South East Australia North America Communications Exchange - meets daily on 1832kHz at 1100 UTC from mid-May to mid-August. Up till July, they had 59 sessions with 681 check-ins, including 179 from North America. Only five sessions have failed to provide any two-way contacts with North America, which represents a 91.5 per cent path reliability. "We would like to hear more Pacific DX on the frequency, but so far only C21, FK8 and YJ0 have joined us," says Roger.

Bill VK2CWG is very active on the DX window of the 80m band. The activity on this band centres around the 3795-3800kHz segment of the band. In the month of July, Bill and his friends worked the following prefixes: US call areas 1 to 7, LU, P29, HK, OA, V73, UA0, 9V1, FK8, VE1, JA1, VE7, 3D2, VY2, OZ, H44, ZL, FO and V63. South America is expected to come alive in August; October will see a shortpath opening to Europe around 1400 UTC and 2030 UTC. From September, India can be worked around 1400 UTC or 2030 UTC between the 3.600-3.699MHz band segment.

"There is a longpath opening to CT2, CT3, CN and EA9 around 0650 UTC before our sunset," writes Bill.

So there you are. Is the 20m band crowded? Go and try 160 or 80 metres. All you need is an average transceiver, a good antenna, which implies that you should have a "bit of space" around the house to put up your long wires, dipoles, v-beams or an experimental antenna of your choice.

The ARRL DXCC Listing

Austin VK5WO has sent me the annual listing of the DX Century Club awards which was published in the June issue of *QST*. At that time there were 324 current countries on the list. The details following contain the callsign and country totals as at **30 September 1990.** Mixed top VKs 300 countries plus: VK4QM 364, VK3YL 355, VK5WO 349, VK6DH 339 and VK6HD 337. Phone top VKs: VK6RU 367, VK5MS 362, VK4QM 349, VK5WO 346, VK6HD 337, VK6LK 336 and VK9NS 311. Highest CW: VK6HD 285. Top stations on phone: TI2HP 371, ZL1HY 371 and W2BXA 371. Top station on mixed: W1GKK 375. Top stations on CW: K6GA 327 and W9KNI 327.

The Voice of the Himalayas - 9N1MM

In my column in the July issue of *Amateur*

Radio, I mentioned briefly that Father Moran celebrated his 85th birthday on 29 May. Who is this Father Moran who, after a heavy day of teaching and administrative work, sits down to his old-style transceiver high up in the Himalayas, in the kingdom of Nepal, and comes on the air to chat with his American friends or with anyone who happens to be around? "This is 9NI Mickey Mouse," he announces around 1200 UTC, and the calls come in.

After exchanges of letters between us two, an interesting little picture emerges of this remarkable radio amateur.

Father Marshall D Moran is a Jesuit priest in Nepal, where he is the principal of St Xavier's school Godavari in Kathmandu. He grew up in the Chicago area of the USA. His first taste of radio came at the age of 12 when he learned to make radio receivers from a school friend. He became a short-wave listener in 1918, and never lost his interest in amateur radio since. As a young 23-year-old priest, he travelled to India in 1929 where he later became the principal of the St Xavier school in Patna, in the eastern Indian province of Bihar. Father Moran spent 20 years in India, and he was active on the pre-war and post-war bands as VU2SX. In 1951 he decided that he would establish a boarding school in the mountain-locked Himalayan kingdom of Nepal. He was the very first foreigner, missionary, school teacher and amateur radio operator there. In those days there was no other way to reach Nepal other than by foot across the Himalayas, with the help of numerous porters. Father Moran built his first equipment himself, which was later replaced in 1961 with a commercial transceiver which he still uses today. He estimates that he made well over 80,000 QSOs during his 60-odd years in India and Nepal.

"Up to this time I am the only operator, except for a few guests and special one-week permits, which are very hard to get. Hopefully the new government may relax the conditions for obtaining an amateur licence. Hopes are high, but they were always high for the past 40 years," writes Father Moran.

He will go to the USA in October for a six-week visiting and lecture tour, after which he will return to his beloved adopted land, Nepal. His QSL manager is: N7EB.

Father Moran 9N1MM in his shack - photo blemishes included.

Future DX Activity

* Bing VK2BCH intends to go back in August or September to Rotuma, to Tonga and to Western Samoa.
* Wolfgang DF4UW will be active on Corsica as TK/DF4UW from 2-13 September. He will use 28620, 21260, 14260 and 7062kHz frequencies. QSL to his home call.
* The Hervey Bay and Gympie amateur radio clubs hope to activate Fraser Island (IOTA OC-142) in November under the call VK4CHB.
* St Brandon Island 3B7. The plans for this DXpedition were on and off during the past month. On the last day of July, Rashid 3B8FP reported that Jackie 3B8CF was on Brandon Island; however he was not given permission to operate there by the Mauritius authorities.
* KP5 Desecheo Island. Look out for a possible 10-day operation starting 23 August under the probable callsign KP2A/KP5. All bands, all modes except RTTY, including WARC bands. QSL to WA2NHA.
* There could be some legitimate activity from Bangladesh in the next two to three months. At least two groups are trying to get permission to operate.
* According to other rumours, LZ2DF/UB5 will be active as D2ACA from 15 September.
* SEANET 1991. The 19th annual South-east Asia Network convention will be held in Northern Thailand, in Chiang Mai, between 8 and 10 November. A special callsign, HS5SEA, will be used during the convention.
* John KA3DBN hopes to be active from Africa during September, especially from Z2, A22, 7P8, 3DAO and C9. All bands, CW and SSB. QSL to home call, direct only.
* Myanmar - Burma. Do not forget that during August and/or September, Romeo, of YA0RR fame, will activate this very rare country.

Interesting QSOs and QSL Information

Note: callsign, name frequency, mode, UTC, month of QSO.

HP1XTP-Tom-14009-CW-0610-June. QSL to AE3Y, RM Brandt, 11 Whittier Ct, Severna Park, MD 21146, USA.

4U1ITU-14010-CW-2100-June. QSL to K4IKM H N Bailey, 3917 Hilton Dr, Mobile, Ala 26609, USA.

ZF2QO-14029-CW-1019. QSL to JA7XBG Ted Sakabe, 3-9-4, Kojirakawa, 990 Yamagata, Japan.

7Q7JH-14019-CW-0430. QSL to K7AP Homer M Brock, 59915 Hilltop Dr, Saint Helens, OR 97051, USA.

VP2EE-14018-CW-0545. QSL to KD6WW Bruce D Lee, 915 P S Strathmore Ave, Lindsay, CA 93247, USA.

3W4DK-21023-0930. QSL via: UA3DK via Bureau.

GD4PTV-Brian-14180-SSB-0737-June. QSL to Brian Brough, Kimmeragh View Ballacorey Rd, Bridge, Isle of Man, UK.

9H4CM-Charlie-21169-SSB-0551-July. QSL to Charlie Mintoff, Shangri-La, Sannat Road, Victoria, Gozo Island, Malta.

3D2AG-Antoine-14016-CW-1101-July. QSL to Antoine D R N'yeurt, PO Box 14633, Suva, Republic of Fiji.

P29DX-Steve-14187-SSB-1142-July. QSL to PO Box 1783, Pt Moresby, PNG.

VU2CVP-Chitra (yl)-14165-SSB-1235-July. QSL to Chitra Vidya Prakash, Box 6330, Coimbatore 641037, India.

SV0HV/SV9-Mike-21245-SSB-0503-July. QSL to KA5EJX Rodney D Huckabay, 4002 70th Street, Lubbock, TX 79413, USA.

FO4DL-Daniel-21296-SSB-0430-July. QSL to BP 14262, Arue, Tahiti.

FO514IW-14181-SSB-0423-July. QSL to FO5IW Stanislas Wisnienski, BP 2139, Papeete, Tahiti.

4K5ZI-14195-SSB-0506-July. QSL to K4RKI Glynn R Furr Jr, 740 Landing Ln, Cary, NC 27511, USA.

ID9/IK2BTI-(Iota EU47)-1422-SSB-0614-July. QSL to IK2BTI Franco Gerosa, Via

Merizzi 36, I-23017, Morbegno, Italy.
5N4BFD-Bert-14222-SSB-0628-July. QSL to DJ9FH Berthold Sefrin, Pirmasenser St 58, D-6662, Contwig 1, Germany.
V73CF-Dick-21205-SSB-0537-July. QSL to KX6BU Kwajalein Amateur Radio Club, Box 444, APO San Francisco, CA 96555, USA.
7Q7JL-John-21205-SSB-0520-July. QSL to PO Box 2907, Blantyre Malawi, Africa.
VP8CGK-John-14126-SSB-1033-Aug. QSL to VK4MZ Kerry S Viney, PO Box 381, Gympie, Qld 4570.

RTTY News

Interesting contacts as advised by Syd VK2SG

* TU2BB-14076-0421Z ARQ. QSL to N2HOS.
* P29RB-14090-1133Z. QSL to Bob Beck, Box 73, Kokopo, East New Britain Province, Papua New Guinea.
* ZD8VJ-21094 at 1930Z. QSL to G4ZVJ.
* ZC4KS-21084 at 1139Z. QSL to ZC4 QSL Bureau or BFPO 53, London, England.
* AE9TL-14086 at 0425Z. QSL via Bureau.
* EP2ASZ-14084 at 2350Z. QSL to Saeed, Box 14155 - 1941, Teheran, Iran, or via IK6GZM.
* 9K2EC-14072 at 0200Z ARQ.
* KE0YG/TF-21074 at 2210Z ARQ. QSL to Home call or to: Lt J G Randal, Jaques, Box 27, US Naval Air Station, FPO NY 07571, NY USA.
* V47RF-14083 at 0054Z. QSL to N5FTR.
* 5W1CW-14084 at 0454Z. QSL to ZL1AMO.

From Here and There and Everywhere

* North Korea a new DX country. The DX Advisory Committee of the ARRL recommended that North Korea be added to the DXCC list with the probable prefix of P5, after the first approved DX operation. The present Korea will remain on the list as South Korea.
* Finally, some good news: 3X1AU and 3X1SG have submitted the necessary documentation to the ARRL DXCC desk, which has approved the operation, and QSL cards for these contacts are now acceptable immediately for credit on the DXCC ladder.
* If you worked 5W1CW lately, it was Ron ZL1AMO. (Ron Wright, 28 Chorley Ave, Massey, Henderson, Auckland 1208, NZ). QSL direct only with the appropriate SASE. If you QSL via the Bureau, you get your own card back rubber stamped by ZL1AMO confirming the contact.
* The strange callsign of R100RW operated by Alex was a special call celebrating the start of the building of the 9010km Trans-Siberian Railway in 1891. It took 25 years to build the world's longest continuous railway line. QSL to UA90A Alex S Pashkov, Box 44, 630093, Novosibirsk, USSR.
* Calling all lady amateurs: Dave ZL1AMN conducted a YL net every Monday on 14222kHz with check-ins at 0530 UTC. There is plenty of DX for the YLs.
* The Latin American DX net is controlled by Nathan OA4OS. He can be found on Saturday/Sunday on 14243 at around 1130 UTC.
* Tony VK9LA wants his QSLs to be sent direct to his Lord Howe Island address: Tony Blasl, c/o PO Lord Howe Island, NSW 2898.
* Contrary to popular belief, the callsign VK9HC is not a pirate, but is not a DX country either. It is a maritime mobile call, the station address is the vessel "Jarita", and he has a mailing address in Queensland. The call is the initials of the owner and was allocated to him by the respective licensing authorities. However, this puts Hans VK9HC into a difficult position: he has to explain his status every time when he has a QSO.
* There has been a lot written lately about the redemption value of IRCs at the Australian post offices. Amounts quoted range from 85c to $1.20. Please note: there is now a new international agreement between postal authorities as from 1 January 1991. Coupons can be exchanged for stamps, not money. Derek VK3DD contacted the Melbourne GPO, where he was given the following advice: The coupon is exchangeable for air mail postage for a standard letter up to 20g in weight anywhere in the world. The Australian redemption value will vary from: Zone 1 = 70c PNG, NZ, Zone 2 = 80c Fiji, Indonesia, Malaysia. Zone 3 = 90c India, Japan. Zone 4 = $1.00 USA, Israel. Zone 5 = $1.20 Europe, South America. Postal rates as at 1 April 1991. This rule applies only to IRCs purchased after 1 January 1991. Similar rule is now in force in the UK and USA.
* Graeme VK3BYO has worked portable from Fraser Island (IOTA OC 142) from 10-15 July.
* Jack T30JH advised me that during his two-months Pacific tour in May and June, he was active from Nauru C21 and Tarawa T30. He was not active from Banaba T33. He is wondering now what to do with the 30-odd QSL cards which were sent to him under the callsign T33JH. Jack has also pointed out to me that the caption linking the term "South Pacific" with T30 is incorrect. (See June 91 *AR*). His information, and my subsequent geographical reading, clarified the position as follows: There are three main Pacific Island groups. Melanesia - meaning black islands -comprises mostly P29, H44, YJ, FK, 3D2 callsigns. Polynesia - meaning many islands - comprises mostly the KH1, KH4, KH3, KH5, T32, F0, VR6, ZK1-2, A35 call areas. Micronesia - meaning small islands - includes the callsigns of KH2, KC6, V63, V73, T30, KH9, C21 and T33. I always had the opinion that amateur radio is a useful tool to improve our geographical knowledge.
* Antoine 3D2AG has left Rotuma Island. He made over 4000 QSOs, mostly on CW.
* The special event station VI4HBW was a great success. In the first week of activity it made more than 2000 QSOs. Both the club and the activity received good publicity in the regional and national press and on ABC radio and TV.

QSLs Received

Note: W = week; M = month; YRS = years; FM = from; MGR = manager and his call; OP = operator and/or callsign.

GD4PTV (4W FM OP), FR5AI/T (4W FM OP), HP8ADU (10W FM OP), VQ9AY (3M FM MGR G4RFV), 3W4VL (7M FM MGR UA3DK), HK0TU (8M FM MGR HK3DDD), 9H4CM (12 Days FM OP), SV2ASP/A (7W FM MGR SV2UA), FP5DX (4W FM OP), S21U (3M FM MGR JA1UT) AND S79KMB (3W FM MGR KN2N).

Thank You

It is always pleasing to receive one or two letters each day showing your support and interest in this column.

Many thanks to: VK2BCH, VK2CWG, VK2CWN, VK2SG, VK3DD, VK4DA, VK4OH, VK4MZ, VK4YB, VK5BGL, VK5WO, VK5ZN, VK6NE, VK6PY, ZL1AMN, DF4UW, P29UV, T30JH, 9N1MM, and the following publications: *QRZ DX, The DX Bulletin* and the *DX News Sheet.*

Good DX and 73

ar

AMSAT

Maurie Hooper VK5EA
11 Richland Road Newton 5074
Packet: VK5EA@VK5WI

2-Line Orbital Elements (215.AMSAT) 3 August 1991

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DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00  0  0 BBBBB.BBBBBBBB  .CCCCCCCC  00000-0  00000-0 0  DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83 58  B 91206.08900840  .00000142  00000-0  99998-4 0  6866
2 14129  25.6955 133.7576 6043592 261.6470  29.9269  2.05878543 33025
UO-11
1 14781U 84 21  B 91208.05575417  .00001458  00000-0  26711-3 0   472
2 14781  97.8981 251.4322 0013395  46.0725 314.1566 14.67160413395296
RS-10/11
1 18129U 87 54  A 91213.48629796  .00000090  00000-0  92377-4 0  7496
2 18129  82.9247  25.3756 0013216  62.5691 297.6808 13.72201604205806
AO-13
1 19216U 88 51  B 91212.85426635  .00000169  00000-0  86587-3 0  2788
2 19216  56.7781  80.5294 7214960 260.8760  18.6520  2.09697352 23966
FO-20
1 20480U 90 13  C 91194.41902861  .00000011  00000-0  54708-4 0  2399
2 20480  99.0303 171.6025 0540057 242.0255 112.5193 12.83183838 66923
AO-21
1 21087U          91213.38297212  .00000090  00000-0  88883-4 0  1123
2 21087  82.9427 200.2829 0036334 130.6278 229.8061 13.74396862 25230
RS-12/13
1 21089U 91  7  A 91212.04530116  .00000087  00000-0  85945-4 0  1129
2 21089  82.9234  71.6009 0029266 154.2605 206.0016 13.73912825 24160
UO-14
1 20437U 90  5  B 91208.19859067  .00000433  00000-0  18614-3 0  4038
2 20437  98.6662 287.4186 0012036  50.2416 309.9784 14.29192441 78700
AO-16
1 20439U 90  5  D 91213.97175889  .00000362  00000-0  15831-3 0  3011
2 20439  98.6706 293.5238 0012811  37.2739 322.9336 14.29279356 79532
DO-17
1 20440U 90  5  E 91210.72915365  .00000383  00000-0  16604-3 0  3016
2 20440  98.6711 290.3532 0013057  45.4891 314.7354 14.29366382 79079
WO-18
1 20441U 90  5  F 91208.73805310  .00000357  00000-0  15542-3 0  2978
2 20441  98.6713 288.4239 0013507  50.7292 309.5085 14.29403193 78791
LO-19
1 20442U 90  5  G 91209.06027790  .00000357  00000-0  15555-3 0  2989
2 20442  98.6709 288.8090 0013841  50.2439 309.9960 14.29480883 78848
UO-22
1 21575U 91 50  B 91210.68960467  .00000495  00000-0  18398-3 0    41
2 21575  98.5413 284.4069 0007495 181.5790 178.5371 14.36093294  1814
MIR
1 16609U 86 17  A 91213.50549239  .00034663  00000-0  42736-3 0  6115
2 16609  51.6011  59.6520 0002690 168.2403 191.8716 15.59849527312235
HUBBLE
1 20580U          91213.16450178  .00003111  00000-0  31411-3 0  4818
2 20580  28.4664 154.5240 0005442  65.9390 294.1769 14.88217233 69029
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National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information Nets
AMSAT AUSTRALIA
Control: VK5AGR
Amateur check in: 0945 UTC
Sunday Bulletin commences: 1000 UTC
Primary frequency: 3.685 MHz
Secondary frequency: 7.064 MHz
(7.064 MHz is the frequency presently in use)
AMSAT SW Pacific 2200 UTC Saturday, 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 330 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows:

AMSAT Australia, GPO Box 2141, Adelaide 5001.

The newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a software service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SASE to Graham.

New Columnist Next Month

After nearly two and a half years with the column I am handing over to Bill Magnusson VK3JT. I'm sure he will have your support, and I know that the ship is going to be in good hands.

HR AMSAT News Service Bulletin 208.01 from AMSAT HQ

Silver Spring, MD, 27 July 1991

To all Radio Amateurs BT

UOSAT-OSCAR-22 Takes A Spectacular Picture Of Italy & Mediterranean Sea

The University of Surrey (UoSat) team has made great progress in the commissioning of all the payload experiments aboard amateur radio's newest OSCAR, UO-22. In less than a week, all the necessary software has been loaded, the satellite has gone through a complete check-out, the gravity-gradient stabilization boom has been deployed, and the first pictures have been taken with the on-board Charged-Coupled-Device (CCD) camera experiment. The CCD camera was the last experiment to be activated after the gravity-gradient boom was extended about 15 feet. Before that experiment could be activated it

was necessary to extend the boom so that the satellite's attitude would remain "earth-pointing" for the benefit of the camera and antennas. With the boom extended and the Attitude Determination and Control System (ADCS) working perfectly, UO-22's camera and antennas should remain pointed at the earth's centre for the duration of its orbital life. If the ADCS finds that UO-22 has "flipped upside down", the ADCS can easily upright the satellite.

After the spacecraft had "captured" upright and on-orbit control was achieved, the UoSat team then concentrated on the most exciting part of the mission: taking pictures. After an extensive imaging software up-loading effort was completed, the first spectacular picture was snapped while UO—22 was over Rome, Italy on 21 July1991 at 10:12:25 UTC. The outline of the "boot" of Italy is clearly visible along with the Mediterranean, Adriatic, and Tyrrhenian Seas. One can also make out Yugoslavia and Greece from the image. This high-resolution picture was converted by NK6K into the popular "GIF" format and is available on COMPUSERVE's Hamnet Forum for those with IBM PCs and EGA/VGA monitors. With this CCD camera experiment now operational, radio amateurs have a second imaging OSCAR on-orbit, the other being the MICRO—SAT WO—18, also performing an earth-imaging mission.

During the next couple of weeks, the UoSat team will be "fine-tuning" all the of the payload experiments. Radio amateurs should look for the announcements concerning UO-22's operations being "broadcasted" on its downlink frequency of 435.120 MHz at 9600 baud using the same Pacsat Broadcast Protocol as the other PACSATs. Please stay tuned to the AMSAT News Service (ANS) bulletins for further information about UO-22.

HR AMSAT News Service Bulletin 208.02 FROM AMSAT HQ
Silver Spring, MD April July 27, 1991
To all Radio Amateurs BT
Austrian Cosmonaut To Operate From MIR In The Fall

Later this fall, an Austrian Cosmonaut will operate AREMIR (Austrian Amateur Radio Experiment Aboard Mir). The mission tentatively scheduled for 2-12 October 1991 will be part of a 16- experiment package called AUSTROMIR '91. MIR's high inclination (51 degrees) makes it available to practically every radio amateur in the world.

The AREMIR equipment will include a modified Alnico DJ120E transceiver for two metres (power limited to three watts), a TNC and CW generator for the AREMIR beacon, and a laptop computer (which is part of the DATAMIR experiment) will be used with the packet equipment. The exact frequency has not been determined, but it is planned to reside within the 2m amateur satellite subband (somewhere between 145.8-146.0 MHz). Continuous Packet bulletins will be 36 characters long interleaved with a six-second tone for doppler measurements. AREMIR equipment is scheduled to be on the manifest of a Progress resupply ship in August. Sergi (U5MIR) may set up the equipment and test it prior to the arrival of the Austrian Cosmonaut. (In an unrelated story It has been reported in the Russian press that Sergi will have his stay aboard MIR extended for another six months, which will make his stay aboard MIR total a full year. In October, Sergi will be joined by his old mission commander, Alexander Volkov (U4MIR)).

AREMIR has a strong educational focus and the Austrian team of hams involved has created a special AREMIR receiver for use in Russian and Austrian schools.

The hardware for AREMIR was made possible by members of the Radio Club for Communication and Wave Propagation (RCCW) in Gratz, Austria. The team was lead by Nick OE6VND and the Dean of the Polytechnic University of Gratz, Prof Dipl Ing Dr Reidler OE6RWD. All hardware has successfully passed all required testing and is in Russia awaiting the trip to MIR. Two Austrian Cosmonauts have been trained for the mission, Franz Viehbock and Clemens Lothaller. Recent information from Russian press sources indicates that Franz Viehbock will fly the mission.

A bit. of nostalgia from "Spacenews" 29 July 1991

Satellite of the Week

The "Satellite Of The Week" feature is in response to numerous requests for amateur satellite transponder passband and beacon frequency information. All active amateur satellites will be covered in upcoming weeks.

Name : UoSAT-OSCAR-11, NASA Catalogue Number: 14781, Launched on 01-Mar-84

Orbit: Low-altitude, circular, sun-synchronous, near-polar

This is an experimental research satellite that contains no active linear transponders. A Digital Communications Experiment (DCE) is available to investigate digital "store-and-forward" communications techniques and various packet radio protocols for use in future satellites containing digital transponders. On-board experiments are designed to be of interest to amateur radio operators and science educators in the study of the near Earth space environment, including the Earth's ionosphere and magnetosphere.

Beacons include:

145.826 MHz NBFM 5kHz deviation, 400mW output AFSK, LHCP antenna

435.025 MHz NBFM 5kHz deviation, 600mW output AFSK, PSK, LHCP antenna

2401.500 NBFM 10kHz deviation, 500mW output AFSK, PSK, LHCP antenna

The VHF beacon carries 1200 baud telemetry, whole-orbit data, DCE downlinks Digitalker audio, and news, and is continuously active. The plain-text news bulletins originate from AMSAT-UK and are carried as standard ASCII having one start bit, 7 data bits, 1 even parity bit and 2 stop bits. Bell 202 modems may be used for demodulation if the demodulated data stream is inverted. Synchronous AFSK modulation techniques are used.

One cycle of 1200 Hz tone = "0"

Two cycles of 2400 Hz tone = "1"

The higher frequency beacons can carry 4800 baud downlinks from the Digital Store and Readout (DSR) experiment, where CCD Imager data is stored, along with data from other on-board experiments. This spacecraft was the first amateur satellite to operate under a Forth operating system. The primary on-board computer is an RCA 1802. It was also the fastest satellite ever built, going from design to launch in just six months!

HR AMSAT News Service Bulletin 215.01 FROM AMSAT HQ

I = rotate image 180 degrees for best orientation
r = image contains some repeated 254-byte data packets

File	#	Date	Time	Lat	Lon	Scene
CCD1A	(33)	TUE 23 JUL 91	07:25:00 UTC	26.8oN	50.6oE	Persian Gulf (I)
CCD2A	(39)	TUE23 JUL 91	10:52:00UTC	4.2oN	4.8oE	Equatorial Africa
CCD3	(8f)	TUE 23 JUL 91	14:12:00 UTC	6.5oN	54.4oW	French Guyana (I,r)
CCD4	(93)	WED 24JUL 91	08:29:00UTC	29. IoN	35.2oE	Sinai + Nile Valley (I)
CCD5	(97)	WED 24 JUL91	16:50:15UTC	3O.9oN	89.8oW	Florida+ M'IPI DELTA(r)
CCD6	(9D)	THU 25 JUL 91	09:31:02 UTC	39.4oN	21.9oE	Balkans (I)
CCD7	(A0)	THU 25 JUL 91	11:53:14 UTC	37.2oN	104.2oW	Denver (r)
CCD8	(aS)	FRI 26 JUL 91	02:15:30 UTC	34.8oN	129.7oE	Korea (I)
CCD9	(a9)	FRI 26 JUL 91	15:43:00 UTC	17.2oN	75. SoW	Cuba + Haiti (I)
CCD10	(aa)	FRI 6 JUL 91	18:59:15 UTC	32.8oN	121.1oW	California (I)
CCD11	(b1)	SAT 27 JUL 91	16:40:30 UTC	42.8oN	84.5oW	Great Lakes (r)
CCD12	(b6)	SUN 28 JUL 91	08:05:00 UTC	34.0oN	3O.5oE	Eastern South Africa (I)
CCD13	(b8)	SUN 28 JUL 91	11:55:00 UTC	36.9oN	3.2oW	Spain + Mahgreb(I,r)
CCD14	(bd)	MON 29 JUL 91	10:25:95 TC			Denmark + Netherlands (I)
CCD15	(be)	MON 29 JUL 91	12:06:05 UTC			Ireland

Silver Spring, MD 3 August 1991
To all Radio Amateurs BT
GO/K8KA Provides UO-22 Current Status Report #12: 29-JUL-1 991 17:30 UTC

We have now completed the initial phase of UoSAT-OSCAR-22's commissioning (and also a successful AMSAT-UK Colloquium at UoS). All of UO-22's subsystems have been exercised and are working.

Although we have been preoccupied by the CCD camera, we have also checked the [spacecraft] horizon sensors and total radiation dose experiment during the last few days.

With the commissioning complete and several good CCD images in the RAMDISK, we will now "open" the UO-22 uplink to amateur stations. As stated in previous releases, UO-22 is primarily a data downlinking satellite, not a BBS communications satellite.

We expect that most stations using UO-22 will be downloading raw CCD images using the PACSAT Broadcast Protocol. Since we don't intend to support BBS operations, only the Broadcast Protocol server will be available, not the FTLO file server.

Of course, without the FTLO server, there is no way for you to get a directory of files on the satellite, and you are working `blind.'

We will solve this problem in the near future with a broadcast directory. In the mean time, please check UO-14 for a list of recent picture files, or capture whatever UO-22 file we have placed on long broadcast.

Please do not "go fishing" by trying to broadcast every file on the satellite. A list of interesting files is included in this report.

The UO-22 picture files are more than 300 kbytes long. In our experience, you can easily receive one of these files in a pass. We would suggest, however that stations resist the temptation to "begin" broadcasts. If several stations in the footprint Begin broadcast of the same 300 kbyte file, the broadcast protocol will work inefficiently, and a lot of repeated data will be sent on the downlink. Use the Broadcast Protocol in its most efficient mode: Grab or Capture for a couple of passes, then request hole fills to get the parts of the picture which you have missed.

This will result in the best performance for everyone. We will all have a lot to learn about Broadcast operation with such large files.

The OBC186 and Transputer CCD support programs on the satellite are still being debugged, so not all of the pictures we take will have the "nominal" data format.

In particular, there are sometimes 254-byte blocks repeated at places in the raw picture files.

If you are happy working your way through such problems, then by all means do so.

If you prefer to get your images after they've been cleaned up, then wait for CIF files to be uploaded to UO-14. Some custom utilities and shareware programs for doing your own GIF conversions will be placed on UO-14 soon.

73, JEFF WARD, G0/K8KA **ar**

Satellite Activity for April/May 1991

1. Launches

The following launching announcements have been received:

Intl No 1991-	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
030A	Meteor 3-4	24 Apr	USSR	109.5	1229	1190	82.6
031A	STS-39	28 Apr	USA	89.4	263	249	56.0
031B	IBSS		USA	89.4	263	248	56.9
031C	USA-70		USA				
032A	NOAA-12	14 May	USA	101.3	841	821	98.7
033A	COSMOS 2143 through	16 May	USSR	114.2	1444	1414	82.6
033F	COSMOS 2148						
034A	SOYUZ TM-12	18 May	USSR	90.2	333	264	51.6
035A	RESURS-F-10	21 May	USSR	88.8	274	194	82.3

2. Returns

During the period 39 objects decayed, including the following satellites:

1967-027A	Cosmos	151 06 May
1976-116A	Molniya 2-16	21 Feb
1981-020A	Progress M-7	07 May
1987-036A	Cosmos 1838	15 May
1987-036B	Cosmos 1839	08 May
1991-020A	Progress-7	07 May
1991-031A	STS-39	06 May
1991-031B	IBSS	06 May

3. Notes

1991-031B IBSS and -031C USA-70 were deployed from STS-39 space shuttle "Discovery". IBSS was retrieved by STS-39 on 6 May and returned to Earth.

1991-034A Soyuz TM-12 carried two Soviet andone British astronauts, all of whom are amateur radio operators. The British astronaut Helen Sharman returned to Earth on 7 May aboard Progress-7.

Bob Arnold VK3ZBB

WARC-92 UPDATE

DAVID WARDLAW VK3ADW
WIA WARC COORDINATOR

Proposals to go to WARC 92 are now Appearing

A number of countries, including Australia, have published their preliminary positions for WARC-92.

The CEPT (European Conference of Administrations of posts and telecommunications) which has 31 members has produced its provisional views.

And CITEL (Inter-American Telecommunications Conference) has published the Report of the CITEL 1992 World Administrative Radio Conference Interim Working Group.

I am now in a position to let you know the provisional proposals of Australia for WARC-92 with regard to the Amateur Service.

Australia supports a realignment of HF broadcasting allocations on a world wide basis in relation to harmonising the amateur allocations near 7 MHz, provided that there is no net loss of broadcasting spectrum.

There are no proposals for intrusions into any other amateur bands from Australia.

The situation with regard to Wind Profiler Radars is of concern to amateurs as the optimum frequencies being quoted are around 50 MHz and 400 MHz as well as 1000 MHz.

As there is a problem at 406 MHz with interference to Search and Rescue Satellites from Wind Profiler Radars, alternative frequencies between 440 and 450 MHz have been mentioned.

WARC-92 due to the limitations of its agenda will not be in a position to make an allocation to Wind Profilers.

Australia has said there is a need for CCIR and WHO to conduct urgent studies, and for a later WARC to examine the matter of suitable bonds for the operation of wind profile radar.

HF Broadcasting

The USA has proposed the World Wide harmonisation of Amateur and Broadcasting in REGIONS 1,2 and 3

6900-7000 kHz	~~FIXED~~	
	AMATEUR	CHANGE IN ALL REGIONS
	AMATEUR SATELLITE	
	Land Mobile (Secondary Service)	
7000-7200 kHz	AMATEUR	
	AMATEUR SATELLITE	
7200 - 7300 kHz	BROADCASTING	CHANGE IN REGION 2
	AMATEUR	

New Zealand says no intrusion into Amateur, Amateur Satellite allocations.

CEPT Position:

In respect of the 7 MHz situation the Administrations submitting these proposals offer the following re-arrangements of the existing Amateur,Amateur Satellite and HFBC allocations with a view towards eliminating the present Regional differences and thus standardising the allocations to these services on a world wide basis:

REGIONS 1,2 and 3

6900-7000 kHz	~~FIXED~~	
	AMATEUR	CHANGE IN ALL REGIONS
	Land Mobile	(Secondary Service)
	AMATEUR SATELLITE	
7000-7100 kHz	AMATEUR	
	AMATEUR SATELLITE	
7100-7300 kHz	BROADCASTING	CHANGE IN REGION 2
	~~AMATEUR~~	

CITEL Position

There should be no intrusions into or reduction of the Amateur or Amateur Satellite Service from 3.5 MHz to 10 MHz.

The Broadcasting requirements have greatly exceeded the number of available channels in the allocated spectrum.

HF spectrum is essential for Services other than Broadcasting.

VHF and Up

The original USA proposal that 420-421MHz be allocated to the MOBILE SATELLITE SERVICE which could have affected the Amateur Service in Australia has been withdrawn.

The USA has also made proposals concerning the 2300-2450MHz band which if accented may cause further restriction in access to the band by the amateur service and especially the amateur satellite service.

The USA has a proposed RECOMMENDATION Relating to Interim Implementation of Wind Profiler Radars at Frequencies Near 400 MHz. For WARC-92 to put forward. This could easily affect the 420-450MHz amateur band as the frequencies have been left for the Conference to insert.

(The above tables were also shown in the August issue, but the strike-outs were left out confusing the displays - Ed). **ar**

WICEN

JOHN WARREN VK3DKD PO BOX 226 WHITTLESEA 3757

WICEN at the 10th annual Essendon Canoe Club Night Race

I always thought that ham radio operators were about the weirdest lot going, but on Saturday 3 August my whole concept changed. Who in their right mind would venture out on the Maribyrnong river, after dark, in the middle of winter, with the temperature around 10^{0}, and God only knows what the water temperature was at the time.

The answer - around 100 participants of the Essendon Canoe Club. It seems they have had nine years of this masochist "sport", and this is the first year they have had radio safety coverage. This coverage fell to the WICEN Region H, I & J (formerly called Region 14) which provided three mobile boat operators, three shore checkpoints and net control. With nine operators showing up we had the luxury of two net controllers and one "gofer" as coffee, hot soup and sandwiches were provided for the WICEN operators.

For the technically minded, we used 147.300 simplex as the primary frequency, with 438.800 as secondary. This secondary frequency proved too noisy on the day (due to passing trams) so the repeater on 438.025 was monitored, but was not used in this exercise. The first commandment in all WICEN call-outs still remains "keep flexible".

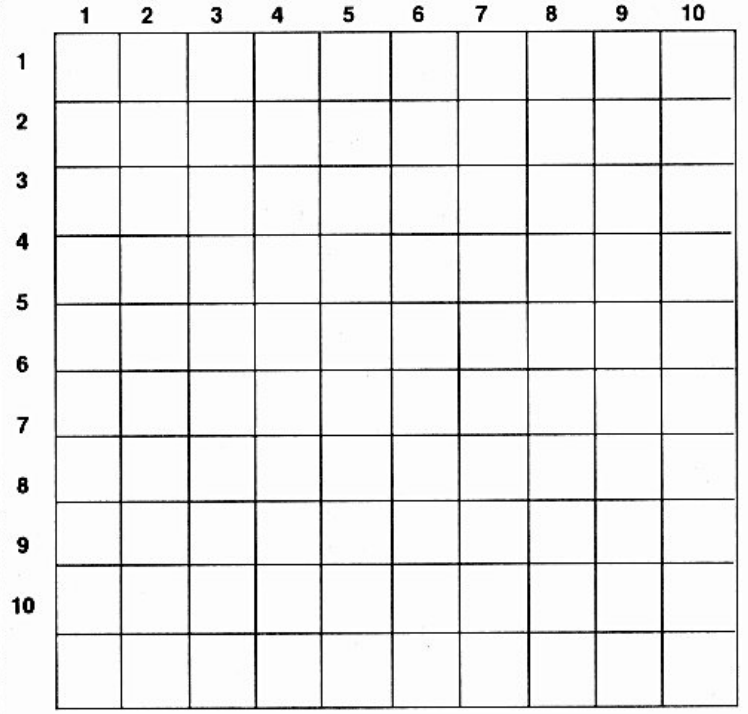
For the sports minded, the club ran an 18km course for open and vet classes, and a 12km junior and women's class. (Whatever happened to equal rights?) A hat with a chemical light was provided since torches were prohibited on the water. All boats had a positive buoyancy and all competitors were required to wear a legal lifejacket.

The race briefing was at 1800, with the first group off at 1830. The net was closed at 2115 with six slightly blue WICEN operators returning for hot soup and coffee.

All this may not be your "cup of tea", but to the nine VK3 operators it was a night to eyeball, talk radio, practise short and clear message handling, and to be part of a community group which gets off its tailbone to enjoy its hobby. When was the last time you left your warm shack and helped out WICEN? **ar**

Morseword No 54

Solution Page 64

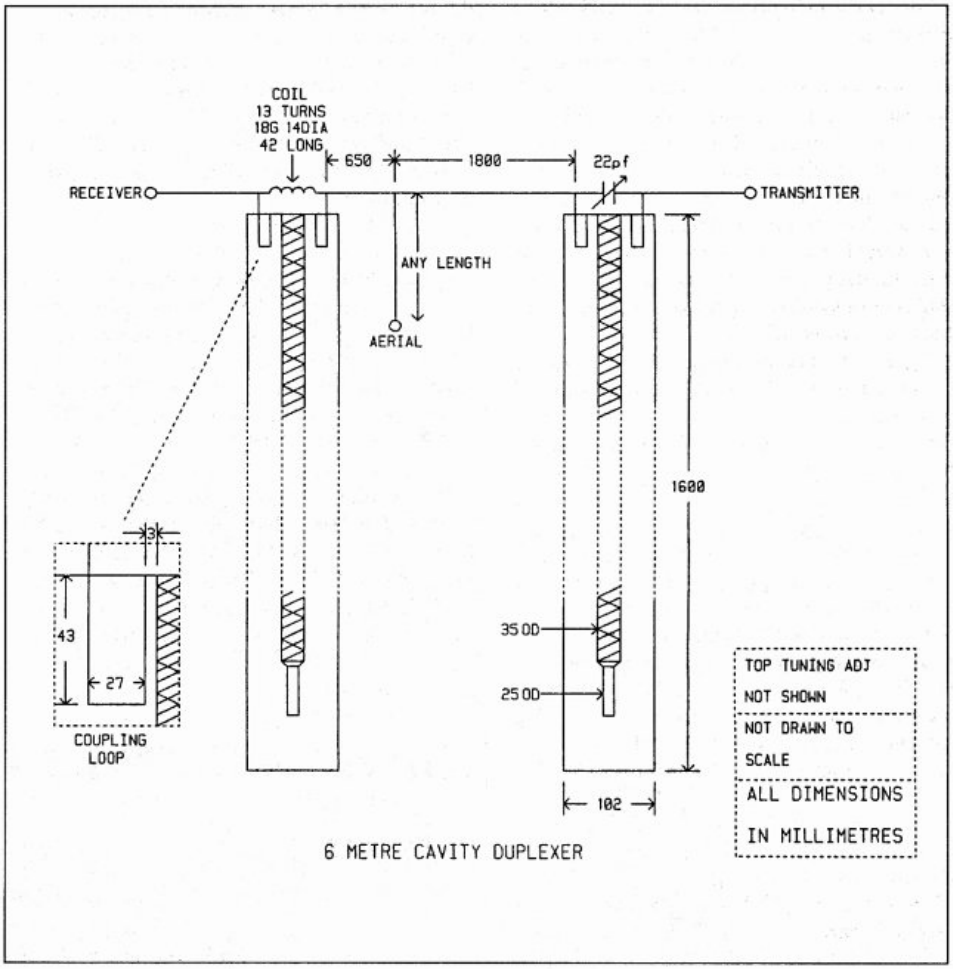


Across:
1 Noble boy?
2 Foe
3 Mix in
4 Communists
5 Strong wind
6 Run fast
7 Barbecue meat
8 Endure
9 Mend
10 Small island

Down:
1 Glen (NSW town)
2 Coral sle
3 Stand for coffin
4 Slaps
5 WWI battlefield
6 Actual
7 Crooked
8 Taxi
9 Hawaiian garlands
10 Ear

REPEATER LINK

WILL MCGHIE VK6UU @ VK6BBS
21 WATERLOO CR LESMURDIE 6076



6 METRE CAVITY DUPLEXER

Six-Metre Duplexer

With more and more 6m repeaters coming into service, a 6m duplexer may be of interest to repeater designers.

The question was, could the familiar 2m cavity be scaled up in size to work on six metres? The results of building two such cavity filters indicated that they would work as notch filters and provide sufficient isolation for a duplexer on six metres.

The design, as shown in the accompanying diagram, is the result of considerable fiddling, but is by no means the optimum. A larger-diameter outside tube would provide superior performance.

Not understanding how the dimensions for the combining coax is arrived at, a lot of cut and try resulted in the dimensions shown. Simply scaling up from the 2m coax sizes did not work. Does anyone know how these coax lengths are worked out?

The inductor in the receive cavity has considerably more inductance than its 2m counterpart.

When completed the duplexer has an insertion loss of 1dB and a notch depth of better than 60dB. Depending on the characteristics of your repeater, this may or may not be enough isolation.

A split aerial system may be required to add extra isolation. In this situation, the cavity filters are not joined via the coax combiner, but connected one in each aerial lead to the receiver and transmitter. The aerial separation in this situation can be as little as two metres.

The centre resonator is a quarter of a wavelength long and will require support other than at the top. Polystyrene can be cut to fit about halfway down the tube and provide this support. This material has no effect on the operation of the cavity filter.

When completed, these cavity filters stand tall, over 1.6 metres tall. The alternative to building these filters is either large vertical aerial separation or a split-site repeater. If you are able to improve on this design, please let me know so I can pass it on.

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST BRIGHT 3741

Very early on in my career as a morsiac (one with an insane dislike of microphones), I realised that argument about the merits of using the code was not going to generate much interest in its use. I was easily conned into writing for Pounding Brass, and soon discovered that a positive attitude was essential to generate ideas for the benefit of morsedom.

I therefore suggest that all morsiacs refrain from worrying about the antics of those who want to drop the code requirements (for whatever reason) and dedicate their time and effort to more positive procedures.

Opponents of morse are directed to read the article "Amateur Morse Code Requirement" on page 4 of *Amateur Radio* for July 1991. They will see that there is a lot of work ahead and that they will have to wait for the WARC after the WARC92 to get their proposals on to the agenda.

Okay morsiacs, what positive procedures?

We need to create an atmosphere where the use of the code is prominent. This means advertising and marketing. And the easiest, if not the best way to achieve this is to have more space in *AR* for morse subjects. What this boils down to is that somebody has to write articles and send them in to *AR*, and any other magazine which might publish them (*ARA, EA* etc).

This somebody should be YOU. If every morsiac wrote an article once a year it would be enough. So get moving.

There are many other positive things you personally can do as well. Give a talk or demo to your local Scout, Guide or Cub groups. Give one-on-one training to someone who you know is interested in an amateur ticket. Maybe they just passed an exam; help them get on air with code. I'm sure you can think of more. I sure hope you can DO more.

Deaf Morse?

VK5JG writes, "I am a very old amateur (84) and consequently I am somewhat deaf. I use a hearing aid which helps in ordinary conversation and in radio listening, provided there is no noise. The hearing aid is set to amplify the higher frequencies which my ears have partly lost, and this amplifies the noise more than the speech and, therefore, is of no use on the HF Phone bands unless the signal strength is S8 or better, or the noise level is unusually low. However, using CW my ears can detect dots and dashes in spite of high noise levels, and I can always copy in this mode. This is a big advantage of CW that I have not heard mentioned before."

This suggests to me that there could be a world of radio communication available to all deaf, or partially deaf, people if only someone could tell them about it, and perhaps show them how to go about getting a licence. Are there any specialist magazines for deaf people? Is there a group near you? How would one go about designing a flashing light controlled by a receiver for totally deaf people? Are you in a position to help?

These days, many amateurs sending CW use electronic keyers, and with these keyers, very fast sending is possible. But many amateurs attempt fast sending beyond their ability, and the result is rushed sending with lack of spacing and no rhythm, and is difficult to read. This rough and fast sending heard by new amateurs deters them from using CW.

Many morsiacs have said in the past that spacing is more important than speed, and any contester will have experienced the truth of this. I noticed that during the two-hour scramble on 1 July the speed setting on my keyer was only about 12wpm, and this seems to be common under noisy QRP conditions where it pays to get the message through first time, as fading often causes a complete loss of communication.

I have a list of 48 people who have been sent Gary Bold's morse programs on disc so far. I am still able to supply these (on 360K discs) and you may either send a formatted disc, with return postage and packing, or send me your request with $5 and I will supply the disc, packing and postage, and as much morse software as I can fit on the disc. I should soon be able to supply 1.2meg discs as well!

Watt is Electricity

Electricity is a colourless, odourless gas which burns with a bright flame.

Light grows from a bulb.

An amp is a little animal that crawls along a wire.

An amp lives in an ohm.

In summer an amp lives in a coulomb.

Polarisation is the changing of an ohm into a coulomb.

An ammeter is an animal that eats amps.

A battery fires amps around a circuit.

An amp rides around a circuit on a megacycle.

Megacycles are parked on a grid.

Flemming's right hand rule states that: All amps must ride their megacycles on the right hand side of the wire.

A charge occurs when all the amps ride down the circuit at the same time.

All amps meet at an accumulator.

An oerstead is an ohmstead for orses.

A joule is a fight between two amps.

You receive a shock when an amp isn't wearing any shoes.

And you must watch out that the amp isn't riding a kilocycle, because then it hertz.

(I don't know where I got this tripe, but it's fun, so thanks) Gil.

ar

ALARA

DOROTHY BISHOP VK2DDB
153A GALSTON RD, HORNSBY HEIGHTS 2077

I am privileged to be your roving reporter for a few months and have been scanning the airwaves instead of scouring the house.

Congratulations to our Publicity Officer Jenny VK3MDR who, on 23 July gave birth to a daughter, Kate Elisabeth May. Obviously another YL for ALARA!

We would like to say a hearty thank you to Rod Torrington VK3TJ, who responded to our appeal for information about the early YL amateurs. Rod seems to have spent a very long time going through all his callbooks and compiling a list of the YL callsigns, names and addresses, covering 1938, then 1947 to 1977. We are beginning to get a fuller picture of the early days and really appreciate the work Rod has done.

Congratulations to Marilyn VK3DMS, who won a silver medal at a Philatelic Exhibition in Melbourne in July. She prepared a stamp collection on the history of radio and its application by amateurs. Being an amateur and a stamp collector, Marilyn found it a lot of fun to prepare and - as this was the first time she had exhibited her radio collection - was surprised it did so well. Want to know the name of the collection?... "Radiomania".

On 21 July, 13 VK5 ladies met at the Springfields Restaurant for a very pleasant ALARA birthday luncheon. Several of the ladies live fairly close, some came from across town, but others travelled quite a long way to be there - Lorraine VK5LM from Mallala and Mary VK5AMD from Bordertown. Afterwards they were joined by some of the OMs for coffee. A highlight of the event was the introduction of a new ALARA item - scarves. I haven't seen one yet, but I like it already!

From VK2, I heard that Joy VK2EBX won the DX-YL certificate in the BYLARA Contest. Congratulations Joy for the certificate, and also for the Life Membership bestowed on you by the Orange Radio Club. It is interesting to hear of the travels of some of our YLs who keep regular skeds whilst trekking into the less populated parts of Australia. At the time of

writing, Maria VK5BMT and Marlene VK3WQ are both in different places in northern Western Australia. Poppy VK6YF had a trip away, and is now back home.

Diana G4EZI is home again in Leeds after a wonderful trip to the YL World '91 Convention in Stockholm. As there were between 200 and 300 YLs from 80 countries, the QRM was tremendous. Every time a familiar voice was recognised, old and new radio friends met with shrieks of delight. A special 'ladies only' station SK0YL was set up and Diana used a special callsign SK5YL on the YL 222 DX net on 1 July.

Speaking of the YL 222 DX net, it is really worth listening to, even if you cannot get on at the time. The net controller is Dave ZL1AMN, and he does a really good job. Since he started taking the net in late March, there have been 96 separate YLs from 22 different countries. The net is on 14.222 at 0600 UTC, but because of time differences, Dave sometimes starts a bit earlier so that girls in America and Canada can get to bed before midnight.

Don't forget the ALARA net on Mondays 3.580+- at 1030 UTC. Conditions have been fun lately outside and inside my household! My OM John has a 2m net at 1000 UTC, so he is relegated to the dining room with his handheld when I start on 80m at 1030. Conditions on the air are not so easy to control, because when I can hear everyone else there is a good chance that they cannot hear me. That's radio! 33

ar

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. The information given below has been supplied to the WIA free of charge by Thornton Publishing. Your divisional library may have copies of the references quoted.

Antennas

Mechanical Details

SPSM Mobile Mount. David A Clingerman W6OAL, *73* issue #369 June 1991 pp 34, 36 -37. il diags and photos. A design for a lip mount which is suitable for supporting a HF antenna for mobile use. A ball mount is included as part of the assembly.

Miscellaneous

Antenna Here is a Dipole. James W (Rus) Healy NJ2L, *QST* vol LXXV No 6 June 1991 pp 23 - 26. il diags and photos. A definition and general discussion of dipoles is given. A table of approximate lengths for each HF band is presented. Practical considerations of construction are described.

Controlled Feeder Radiation Revisited. B Sykes G2HCG, *RadCom* vol 67 No 1 July 1991 pp 46 - 47. il diag. A refinement of a concept of using the last quarter wave of a coaxial feeder as an active radiator, in combination with a normal antenna. The designs of various ferrite chokes to achieve this are discussed.

Transforming the Balun. John S Belrose VE2CV, *QST* vol LXXV No 6 June 1991 pp 30 - 33. il diags, graphs and photo. An extension of W2DU's ferrite bead coaxial balun concept provides 4:1 and 9:1 impedance ratios. Two short lengths of 93Ω coax, enclosed within ferrite beads feed a balanced 200Ω load from a series connected output; the inputs are parallel connected. Similarly, three 150Ω cable lengths can produce a 9:1 impedance ratio. Improved efficiency and bandwith is claimed over a bifilar toroidal balun.

VHF/UHF

Simple Antennas For 2 Metres - Part 2. Glyn Fogell ZS6AKQ, *RadZS* vol 45 No 4 April 1991 p 6. il diags. A design for a quarter wave vertical ground plane antenna is given. Radials are at 45° to the horizontal plane.

Simple Antennas For 2 Metres - Part 3. Glyn Fogell ZS6AKQ, *RadZS* vol 45 No 5 May 1991 p 10. il diag. A Slim Jim design is given, with a general discussion on the technology and performance of such antennas.

Audio

The Oscamp. T C 'Ced' Tanner VE3BBI, *QSTVE* August 1991 pp 3 - 4. il ccts, cmp, pcb and photos. A combined oscillator/amplifier is described. The oscillator has an adjustable frequency output, variable over a wide range. It may also be used as a tone decoder. The amplifier has sufficient output to drive a loudspeaker, and may be used independently of the oscillator. Two ICs form the basis of the circuit.

Computers

Accessories

EA-88 IBM PC Radio Interface. Marijan Miletic YU3EA/N1YU, *QEX* No 112 June 1991 pp 13 - 16. il ccts, cmp and pcbs. A design for a plug-in interface which enables a computer to control the station frequency and mode, to receive and transmit Morse code, and to record and play speech. The latter facility is provided by Continuous Variable Slope Delta modulation (CVSD). The double sided PC board and the necessary software will be made available through MFJ.

Hardware

A Microcontroller Based Multimode Reader. Steve Haynal AA6DG, *QEX* No 112 June 1991 pp 3 - 12. il ccts, cmp, diags, photos and pcb. A complete design for a reader which decodes Morse (3 - 80 WPM), Baudot RTTY (45,50,57, 75 and 100 bauds), ASCII (110 bauds), plus ARQ and FEC TOR modes. A Motorola MC68HC705C8 microcontroller unit is central to the design. A liquid crystal display and an EIA-232 interface are included as options. The necessary software to program the microcontroller is available from the Author.

Improved Serial I/O Interface for PCs - 1. Jim Rowe VK2ZLO, *EA* vol 53 No 7 July 1991 pp 58 - 64. il cct, cmp, pcb and photos. An interface unit which can control the function of remote equipment via 8 different outputs. Similarly, sensing of remote indicators can be done via 8 inputs. Cascading of units can extend the range to 64 inputs and outputs. The device is suitable for use with any RS-232 equipped computer.

Software

Multimode Tx/Rx Software for BBC Micros. (Product review) Mike Wooding G6IQM, *RadCom* vol 67 No 7 July 1991 pp 37 - 39. RX-8 Software package supplied by Technical Software. It supports AMTOR/SITOR (ARQ and FEC),ASCII, Fax, Morse, Packet, RTTY, SSTV UoSAT 1 and UoSAT 2.

Software for the Ham Shack, Part II. Bill Clarke WA4BLC *73* issue #369 June 1991 pp 44 - 45. An extension to part I which incorporates programs for Ohms law, power formulas and efficiency formula.

Swisslog Version 3.66. (Product Review) Dick Goodman WA3USG, *73* issue #369 June 1991 pp 46 - 47. il photos. A discussion of the features of this software package is given. It is a complete QSO tracking system.

Electronic Devices

Miscellaneous

Build the Brass Pounder's Keyer. Dan McCranie AA6GG, *73* issue #369 June 1991 pp 22, 24, 26, 28 and 32. il ccts, cmp, graph, pcb and photos. A memory device which can transmit pre-recorded CW messages reproducing the operator's keying style. The output speed can range from one third to twice the original.

Fan Speed Controller. Peter Phillips, *EA* vol 53 No 7 July 1991 pp 70 - 74. il cct, cmp, diag, pcb and photos. Fan speed is controlled via a SC141 triac, using phase control via a diac. RFI suppression circuitry is included.

Simple Quiz Buzzer. Peter Murtagh, *EA* vol 53 No 7 July 1991 pp 78 - 82. il ccts, cmp, diags, pcb and photos. A common buzzer and individual LEDs are activated by each player's push button. Flip-flop circuitry ensures that activation of any button locks out the other players, until reset. Discrete components only are used.

Trip Lite PR-25A Power Supply and Isobar 8 GS Surge Suppressor. (Product Review) David Cassidy N1GPH, *73* issue #369 June 1991 p 38. A description of a surge suppressor suitable for protection of transceiver circuitry, as well as straight computers.

Telephone Accessories

A Practical and Versatile DTMF Decoder (1). Farrell Segall ZS6RW, *RadZS* vol 45 No 5 May 1991 pp 12, 24. An introduction which outlines the design goals for this 6 digit decoder, to be described in succeeding articles.

Filters

A Pseudo CW Filter. Jim Melton WR5B, *73* issue #369 June 1991 pp 18, 20. il ccts, cmp, pcb and photo. An audio oscillator which is keyed by an in-coming CW signal. It is claimed that hash and static are eliminated.

Packet

Digital Communications for the Radio Amateur Part 5 (Modems). Robin M Braun ZR1RMB, *RadZS* vol 45 No 5 May 1991 pp 4 - 6, 8. il ccts and graphs. A general discussion on the functioning and relative merits of commercially available modems is given.

PSK Anyone? John C Reed W6IOJ, *QEX* issue 113 July 1991 pp 3 - 7. il ccts, graphs and photos. A design for a 1200 baud Phase Shift Keying system suitable for use on HF is given. A 1.8 kHz 6 dB bandwith is claimed. A special tuning aid, to simplify fine tuning adjustment, is included in the design.

Power Supplies

Miscellaneous

Trip Lite PR-25A Power Supply and Isobar 8 GS Surge Suppressor. (Product Review) David Cassidy N1GPH, *73* issue #369 June 1991 p 38. il photos. A description of a 25A 13.8V commercial regulated power supply is given.

Series Regulated

First Steps in Home Construction (1). John Case GW4HWR, *RadCom* vol 67 No 5 May 1991 pp 38 -39. A design for a regulated power supply adjustable from 4.5 to 13V, with an output up to 1A. Current limit is switchable from 100mA to 1A. Part one of this series takes a very basic look at the technique of soldering.

First Steps in Home Construction (2). **John Case GW4HWR, *RadCom*** vol 67 No 6 June 1991 pp 42 - 43. il cct and diag. Part 2 discusses in detail the circuit to achieve the specifications described in part 1, using discrete transistors.

First Steps in Home Construction (3). John Case GW4HWR, *RadCom* vol 67 No 7 July 1991 pp 40 - 41. il diags. This part deals with the construction of the equipment box and front panel.

Receivers

Home Brew

HK-2M 2 Metre Receiver Project. Chris Turner ZS6GM & Henri Ketelaars ZR6HK, *RadZS* vol 45 No 4 April 1991 pp 10 - 12. il cct. A design for a double conversion 2m receiver is given. Crystal control is used for channel selection. Simplicity and low cost is claimed; only readily available components are used. Complete kits will be available from SARL.

Miscellaneous

FRG7 Receiver Modifications. Allan C Ashton, *RadZS* vol 45 No 5 May 1991 pp 14 - 15. A method is described in detail for modification of the fine tuning capacitor, so that tuning of SSB signals is easier.

Technology

HF Direction Finding. Chris Plummer G8APB, *RadCom* vol 67 No 6 June 1991 pp 38 - 41. il cct, cmp, diags and photos. A general dissertation on the theory of DFing, and its sport protocol. A specific design is offered for a 160m receiver for this purpose which includes sense circuitry.

Parts Substitution. Bruce S Hale KB1MW/7, *73* issue #369 June 1991 pp 40, 42. A general beginner's guide which describes how parts on hand may be substituted for specified components. Resistors, capacitors and semi-conductors are considered.

The EZY Launcher. Wade A Calvert WA9EZY, *QST* vol LXXV No 6 June 1991 pp 34 - 35. il cartoon and photos. A design is given for a catapult device which can project a line over a tree branch. A fishing reel is attached; the brake may be used to control the trajectory of sinker and line.

Transceivers

Home Brew

A Miniature 80 Metre SSB Transceiver (1). Mike Grierson G3TSO, *RadCom* vol 67 No 6 June 1991 pp 44 - 46. il ccts and photos. The complete design of a 30W 80m transceiver, which is based around low cost IC chips developed for cellular radio.

A Miniature 80 Metre SSB Transceiver (2). Mike Grierson G3TSO, *RadCom* vol 67 No 7 July 1991 pp 30 - 32. il ccts. An elaboration of the detail for this transceiver is given in this part.

Product Reviews

FT-1000 Yaesu HF Transceiver. Peter Hart G3SJX, *RadCom* vol 67 No 6 June 1991 pp 49 - 51. il graphs and photo. A report, with measurements included, on the performance of this transceiver.

QST Compares: Dual-Band Hand-Held FM Transceivers. James W ('Rus') Healy NJ2L, *QST* vol LXXV No 6 June 1991 pp 36 - 41. il photos. A feature by feature comparison of the performance of Alinco DJ-560T, ICOM IC-32AT, Kenwood TH-77A, Standard C228A and Yaesu FT-470 dual band transceivers. Measurements are compared against specifications. A comprehensive yes/no chart is provided.

The KE2AM Voice ID and Repeater Controller. Bill Brown WB8ELK, *73* issue #369 June 1991 pp 12. il photo. A review of a commercially available module which includes voice identification, time-out timer and squelch tail timer for repeater operation.

Transmitters

QRP

Three Bands with One Rock. Mike Gasperi WW9X, *73* issue #369 June 1991 pp 10 -11, 42. il cct, cmp, pcb and photo (p 34). A design for 80, 40 and 20m, which uses frequency division from a 20m crystal for the lower bands. Power output is aproximately one watt. A limiting circuit allows full break-in operation. An appropriate π network filter is selected for the band in use.

VFOs

Build a Universal VFO. Doug DeMaw W1FB, *QST* vol LXXV No 6 June 1991 pp 27 - 29. il cct, cmp, photos and pcb. A design is presented for a low drift VFO with buffered output (2.3 dBm). The frequency ranges for which specific component values are given are: 1.8 - 2, 2.1 -2.6, 3.5 - 4, 5 - 5.5 and 7 to 7.3 MHz. A DC controlled frequency offset is incorporated. Frequency drift is less than 100 Hz in the initial 4 minutes at 2 MHz.

Glossary of Abbreviations

il The article contains illustrations, a list of which follows.
cct A circuit diagram
cmp A component layout drawing
EA *Electronics Australia*
diag A mechanical drawing
pcb A master drawing from which printed circuits may be produced
QSTVE *QST Canada*
RadCom *Radio Communication*
RadZS *Radio ZS*
73 *73 Amateur Radio Today*

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ar

Help stamp out stolen equipment - keep a record of all your equipment serial numbers in a safe place

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH
CO-ORDINATOR
'AVIEMORE' RUBYVALE 4702

Band Conditions have been rather poor on all bands, and variable at best. From the summary it is evident we are getting a lot of non-stop RRTY F7B. These are very difficult to resolve. Solar activity is hampering those around 14.023MHz but, despite this, they are still causing annoyance in VK.

By and large, our biggest offender on the bands is USSR. Their broadcasters tend to use unnecessarily high power, and radiate signals of inadequate transmission quality.

Listen on 21.355. It has the fundamental on 21.505. In VK4 it can be heard at S9+40dB. It is broad, and interferes with other domestic SW sections due to poor sideband control and splatter. It is listed as being in CHITA. Who would want to know them, with such operating methods? I hope Radio Australia, which shares this frequency of 21.505, has cause at some time to complain. We may see some action on our behalf then, but don't hold your breath!

Why does USSR have such poor operating procedures?We surely would not put up with it in VK, would we?

Many R7B & P0N intruders in 29-29.7 segment, some as wide as 30kHz, very hard to track down when no callsigns given.

Reports this month from: VKs 2GDF, 3DVT, 4BG, 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 5TL, 6CH, VK6RO, 6XW, 7RH and 2EYI (sorry Don, you should've been up the list a bit). My thanks to all. Gordon VK4KAL. **ar**

IARUMS Summary for June 1991

Date	Time U/TC	Freq in MHz 'M' or 'E'	Callsign if Heard	Mode	RST	Logs X	Details of Traffic if Known and any other Information
150691							
105691	1009+	3519		P0N			Signals 9-12kHz wide also on
1606	1051+	3595		P0N			3549/3564/3585kHz
1005	1325	7002+	"V"	A1A		5	Machine code abt 5wpm
170691	1341	7020		A3E		1	Asian b/caster music
1206	1325	7058.5		A2B			Duplex QSV BR QSA1 de LSD3
1806	1215	7080	A3E				B/c interview in an Asian lang
1806	0746	14000		J3E		4	Foreign b/caster, Pacific Is tfc
2406	0625	14002/3		J3E		4	B/c foreign
250591	mni	14005+		F7B?		22	Non-stop RTTY? no shift given
2805	mni	14007		F1B		16	RTTY 1000Hz shift
2405	mni	14023.5		F1B		28	RTTY 250Hz shift plus RYs
0106+ hrs	mni	14044/5		J3E/L		72	Asian RTF+N0N to 14048 24
Mni	mni	14058		AC3		60	24 hrs Helschreiber
Mni	mni	14070+	VRQ	A1A		78	Viet 5 ltr code
Mni	mni	14070	VBX	A1A		26	as above with VPC in this group
Mni	mni	14085+	NPO	A1A		16	with KFB all VRQ clones
Mni	mni	14140	UWXS	Multi		8	Nav radio/Yaroslavl (57deg40'N x 40deg E) ULYA often replies
This station appears to be for certain activities, ie SPY NETWORK!							
2605+	mni	14170	UMS	F1Bcw		33	Mostly 250Hz shift RTTY
170691	1040	14174	5PP	A1A		7	No other info
2505+	2210+	14202+		F1B		15	2ch 14205.5 NOT F7B
1106	0734	14210		F1B		2	3kHz wide
Mni	mni	14211+		multi		59	1000Hz/14215-250Hz RRTY
Mni	mni	14217+	UMS	F1B		7	ID in CW Mosc Nav rad USR
0906	0230+	24907	CNN	J3E		2	News b/cast, ON this mode?
2305	0505	21031.5	UMS	F1/A1		18	MNR all day USR
Mni	mni	21115+	CQ5	A1A		17	To 21120MHz Tfc out
1606+	1040+	21250		R7B		5	Jammer abt 4kHz wide
2305	0535+	21347		F1B+		21'	SX fax (SP 120rpm 24 hrs on
2606	0700+	21355		A3E		12	Broadcast Russian language
250591	0529	28478/9		F1B		16	Continuous RTTY 1000Hz shift
2205	0655	28484		F1B		2	RTTY as above
2206	0933	28980		A3E		4	B/c band music/talk in Russian
2305	0525	29190		A3E		4	B/c music & speech, French?

DIVISIONAL NOTES

VK6 NOTES

HARRY ATKINSON VK6WZ

Has any other Division ever received 18 nominations for its council?

The postal ballot resulted in a 62 per cent return from eligible members, with four per cent of that number informal. The results:

VK6WZ	379 votes	VK6AFA	215
VK6IW	333	VK6KWN	210
VK6HK	331	VK6DA	204
VK6NE	321	VK6ZGT	203
VK6OO	314	VK6ZTN	184
VK6GU	306	VK6ATA	130
VK6LZ	253	VK6TTV	119
VK6ZIZ	248	VK6BC	117
VK6QL	230	VK6NBG	88

The nine in the first column were duly declared elected to the VK6 council for 1991/92. President, VK6LZ; vice president, VK6WZ; treasurer (reluctant, he says) VK6OO. VK6AFA, although not elected as councillor, has agreed to continue as secretary, for which we thank him!

The WA Annual 80m CW contest has come and gone, but the 'phone section comes up on Sunday 7 September. Give it a go - it runs only three hours. Refer pages 33 and 34 July *AR*.

Next month brings two important events - the NCRG Hamfest at Carine TAFE and, of course, JOTA,. And spanning part of this month and next, the Southern Electronics Group special event station to mark the 200th anniversary of Captain Vancouver's landing in King George Sound in 1791, 35 years before Lockyer landed his small party of settlers to found Frederickstown, now Albany.

VI6SR will be on air from 28 September to 11 October. All bands. All modes. *(See Club Corner p54 for further details. - Ed)*

5/8 WAVE

ROWLAND BRUCE VK5OU

Okay, so there was a double dose of 5/8 Wave last month, but I've got it right now, and I am indeed your guest contributor this month whilst Jenny is away. Please note that, contrary to the pattern the September meeting of the WIA will not be members' equipment night, but instead will be the first of the meetings to be run by an affiliated club, namely VK5BP and will be devoted to JOTA and AUSSAT involvement in particular. The members' equipment night will now be the October meeting.

The exhibition put on by WIA and affiliated clubs at the Hobbies' Fair at the Wayville Showgrounds was a great success. Unfortunately, having fixed things so I would be free to lend a hand in the setting up, and in the operating of the WIA station, Murphy struck in the form of the worst cold/flu I have had in years and all I could do was to listen on 2m in bed. This means that to date I am not sure of all the people I should thank for their involvement. I'll sort that out in due course, but, ahead of that, let me say that a vast number deserve those thanks. The exhibition showed many aspects of this hobby of ours: transmitting stations, both amateur and CB, ATV, packet radio, RTTY, SWLing readily come to mind, and there were probably other things too which I have yet to catch up with. Thank you all for your involvement.

Camp Quality is a camping experience - and much more - for children with cancer. At the July meeting,a short talk was given by Kevin Johnson, who is the registrar of the Camp Quality organisation. The organisation is a non—profit one, supported in SA by Saints Church, Rotary International Districts 9500 and 9520, and by the Adelaide Medical Centre for Women and Children, (ACH as was.) He told us that at this year's camp it is planned to run a short technology activity for the children. In fact there will be five of these for eight to ten children, each lasting about 90 minutes. Two will be morning of 30 September and on on 4 October. Kevin is looking for volunteer helpers, people who can solder a joint or else unsolder it and use wick, etc. The children will already have one-to-one adult care; this is extra. If you feel you can spare some time to help, or can lend equipment then please give Kevin a ring on 230—9612(w) or 341—2711(h) and he can give you further details. On top of this, Chuck Waite has arranged to run an amateur station at the camp using his own callsign, which happens felicitously to be VK5CQ.! If you would like to help with this, contact either Kevin or Chuck. This really is an area where we can extend our hobby beyond the normal limits. Talking of limits, the children on camp, although cancer sufferers, are very fit and active engaging in activities as demanding as abseiling for example. Please give it some thought. **ar**

VK2 NOTES

TIM MILLS VK2ZTM

Happenings:

The Alinco ballot has now been completely distributed. There were almost twice the number of applications to available units . . . Trash and Treasure on 29 September at Parramatta . . . Fourth Gladesville/AUSSAT test scheduled for 25 September.

The July test was well received in the south-east footprint. Listen to your Divisional broadcast for details nearer the date . . . Don't forget to submit your RD Contest entry, VK2 needs your score . . . The VK2RSY beacons were fully restored to their original antennas at intervals during July as repairs were completed . . . About the same time, however, it was discovered that the birds had taken a fancy to the 70cm repeater antenna, and chewed holes in the radome and coax, to the extent that it had become water cooled and about as good as that piece of wet string . . . Peter VK2NPW conducted a test for three months with a relay to 15 metres on behalf of VK2WI. It provided good feedback on the interest shown, and many thanks to Peter for his efforts. Until equipment is obtained for placement in service at VK2WI, we are interested in relays to 20-17-15 and 12 metres. A couple of stations per band could share the workload.

In late July the Division hosted a meeting of Packet BBS operators and interested parties to discuss many aspects of current operation . . . A 70cm forwarding port has been added to VK2RWI packet.

Members will be aware that the Division maintains an extensive historical record on all VK2 callsigns under the supervision of Jo VK2KAA. To assist research of these details, please consider passing on your old log books and other records when clearing out the shack or winding up a silent key estate.

Don't forget the QSL card collection. The written record on them is far more valuable for the research than sent somewhere else to make up a display of pretty cards. Please forward to the Divisional office - see page 3 for contact details.

New Members

A warm welcome is extended to the following who recently joined the NSW Division:

WB	Chegwidden	VK2GIZ	Miranda
MWJM	Collett	VK2UCM	Mt Warrigal
M	DeBarse	Assoc	Emu Plains
PA	Head	Assoc	South Windsor
MJ	McNeill	Assoc	Cherrybrook
SH	Mills	VK2UMI	Marrickville
WA	Phillips	Assoc	Kingsgrove
MR	Ramsay	Assoc	St Clair

Divisional Voice Mailbox

A few months ago the Division received an offer from AAP Communications, Sydney, to provide the Division with an experimental voice mailbox. This may be accessed by telephoning (02) 552 5188. Each week a summary of the VK2WI broadcast is placed into it.

From any phone you can dial in, hear the report and, if you like, can leave a message by following the instructions given.

If you have no message, just hang up at the end.

If your phone has DTMF facilities or you have a separate tone sender, you can access additional facilities, as follows:

Rewind 10 seconds	Press 1
Rewind to start	Press 1-1
Pause or restart message	Press 2
Advance message 10 seconds	Press 3
Skip to end of message	Press 3-3
Slow down message speed	Press 4
Speed up message	Press 6
Increase volume level	Press 9
Reset volume level	Press 8

Improvements to 23cm Repeater

A couple of years ago the Division received a donation from Dick Smith Electronics of equipment to establish VK2RWI on 23cm. It has operated on a pair of small antennas on the main tower.

The Division has just received a further donation from DSE of a pair of high gain vertical antennas which will replace those currently in service. Our thanks to Dick Smith Electronics for its support to the amateur radio service by way of these donations to the Division. **ar**

QSLS FROM THE WIA COLLECTION

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139. PHONE: (059) 64 3721

Korea – Land of the Morning Calm

Since the Korean war, Korea has become quite well known to the majority of Australians, whereas before the 1950s little was known about the country except perhaps that it occupied the large peninsula that jutted down from the Asiatic mainland towards Japan.

Almost the area of the State of Victoria, Korea consists of two separate entities, the Republic of Korea, commonly known as "South Korea" and the slightly larger Democratic People's Republic of Korea, referred to as "North Korea" separated at the 39th parallel of latitude. It had been secretly agreed at the Yalta Conference that US forces would accept the surrender of Japanese forces south of this line of demarcation, the Russian army doing likewise north of this line. Now, despite the costly Korean War of 1950-53 in which a million lives were lost, the situation remains exactly as it was planned (as a temporary adminis-

trative measure) before World War 2 had ended.

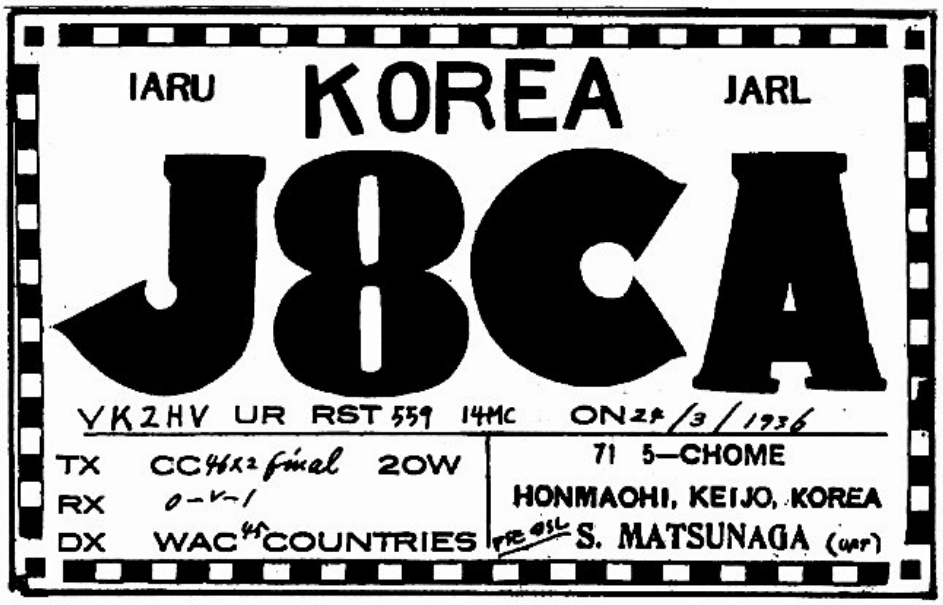
The letter "J" has always been associated with Japan in callsign listings, the *Year Book of Wireless Telegraphy* of 1915 setting down the ITU's allocation of the letter to "Japan and Possessions". The 1920 edition of the same publication gives the more precise allocation of JAA-JZZ. The magazine *"Radio"* of Jan 1937 gave the ARRL listing of "Chosen (Korea) as J8. (At about the same time, J9 was allocated to Taiwan and J1-J7 to mainland Japan). In Jan 1940 (the US was not then at war), the publication *Radio* gave the listing Chosen (Korea) as J8C. No prefixes were published in the major radio magazines after 1941, with the exception of the prefixes of the USA and its possessions.

J8CA

There seems to have been only a few amateur radio stations active from Korea before World War 2. The WIA Collection contains QSLs from J8CA (as shown) as well as those of J8CD. These were probably the most active stations in Korea at the time. On some of their cards we read the QTH as "Korea, Japan" the Japanese having annexed the country in 1910. There is little doubt that the Japanese developed both the agriculture and the industry of Korea for their own use, little thought if any, being given to Korean aspirations. In fact, from 1941 occupying authorities even banned the Korean language, insisting that all Koreans learn and use Japanese. On one of the J8CA QSLs the QTH is given as "Chosen, Japan". Chosen is the Japanese for Korea and this name frequently appeared in DXCC country listings both before and after the liberation of the country.

After the cessation of World War 2 hostilities, US forces in South Korea reactivated the former J8 prefix. The WIA Collection contains the QSL card of Korea's first post-war amateur station. This was W20AA/J8, the card being dated June 1946. It was sent from Sgt Harry Paston of the 7th Infantry Division, US Army. The allocated calls all have the prefix J8A, and none was allocated to Korean nationals. QSLs held by the WIA include J8AC5, J8AAJ, J8ASC, J8AAK, J8AAR and J8AAA. (Sig Corps Station in Seoul).

In 1948 the J8 calls were discontinued being replaced by the prefix HL. Current stations dropped the first letter after the number but retained the remainder of the callsign suffix. (*QST*, April 1948). Station J8AAK became HL1AK (Altered QSL in WIA Collection dated March 1948) whilst J8AAR, also quite active, changed its callsign to HL1AR. (Date of altered QSL April, 1948). The May 1948 edition of *QST* stated that the HL calls were allocated by the General HQ of the Far East Command in Tokyo to both enlisted personnel and civilians attached to US Army forces in Korea who held amateur radio licences. All calls were assigned from the series HL1AA through HL1ZZ, the



ITU conference at Atlantic City in 1947 having allocated the prefix block HLA-HMZ to Korea.

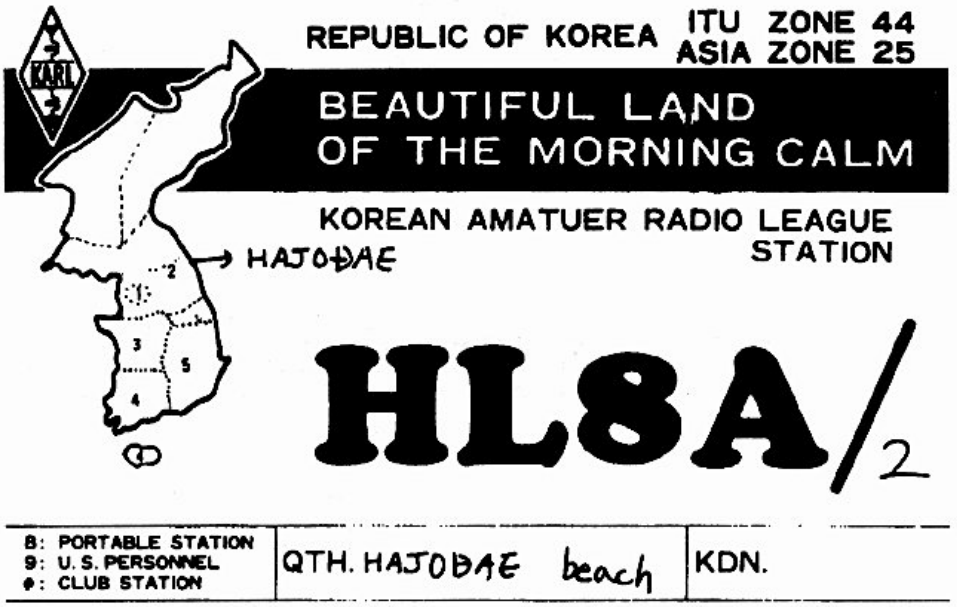
The Feb 1951 edition of *AR* gives an interesting account of amateur radio activity in Korea upon the outbreak of the Korean War. Station HL1CD in Pusan was the first participant in the emergency and was contacted with the message from Seoul to clear the Pusan airfield after regular communications had been cut. With HL1US in Seoul the two stations maintained a vital link with General MacArthur's HQ in Tokyo. The WIA Collection is fortunate in possessing the QSL of station HL1CD in Pusan. The QSL is dated February, 1950 just a few months before Communist forces in the north swept down to take almost all Korea except for a very small area in the of the south-east of the country being stopped at what was to become known as the "Pusan Perimeter".

From 1 August 1960 the HL prefix changed to HM, the KARL (Korean Amateur Radio League) HQ station HL9TA becoming HM0HQ. The HL2 prefix had been issued to experimental stations which were not permitted to operate outside Korea, whilst the prefix HL9 was retained by US personnel. It is interesting to note that despite this general allocation, the call HL9TA was granted in the late 1950s to the KARL, being the first call assigned to Korean nationals There were five licensees operating the station, including a YL. The station ran on 50 watts and transmissions were on phone only. For Korean nationals, the prefix HM9 was issued for portable operation (eg the portable KARL station HM9A operated from Cheju Is in 1960

and from Dok Do Is in 1962) The prefixes HM1-HM5 reflected the geographical areas of South Korea, whilst HM6 and HM7 were reserved for North Korea upon reunification. HM8 was a novice type prefix and HMO was reserved for clubs.

The special "Club" prefix, HM0 is especially allocated to university and college radio clubs together with special stations such as the Boy Scouts, HM0S.(See *AR* Jan, Feb 1991 for an account of the Movement) The HM0U QSL shown was sent to "STK" Roy Jonassen VK4NE in April 1981 from the Seoul National University ARC.

After 1982 this HM prefix reverted to the former HL prefix. The reason for the change lay in the fact that the ITU had allocated the prefix block of HMA-HMZ (as well as P5A-P9Z) to North Korea.



HL8A

The fairly uncommon prefix HL8 is currently being used by Korean stations operating portable. It is one of a series of prefix changes for portable/mobile stations. HM9 was used in the 1960s and '70s, HM8 for a brief period only in the early 1980s and HL8 from 1982. The HL8A QSL is special in that it is the portable call of the KARL whose general callsign is HL0HQ

The QSL shows the geographical areas corresponding to the South Korean prefixes HL1-HL5 (The city of Seoul itself is HL1) as well as the epithet "Land-of the Morning Calm" -actually a translation of the now disused title "Chosen" but an apt description of a land of high mountains, sparkling streams and gentle people.

HL88XP

The Summer Games of the XXIVth Olympiad were held in Seoul. (See *AR* July, August 1990 for the story of the Olympic Games through QSL cards). South Korean stations were permitted to use the prefix HL88 during the period 5 Sept-5 Oct 1988 to commemorate the Games. The KARL HQ station HL0HQ used HL88HQ whilst the station HL1XP used the call HL88XP (as shown). On this QSL is shown the Korean flag. This has a white background (representing peace and the traditional Korean white clothing), and in its centre we see a "T'aeguk", two pear-shaped figures intertwined which represent the interaction of forces in the universe. In each corner of the flag are four "Kwae" which correspond to the four seasons, four cardinal directions and the sun, moon, earth and heaven. The flag, based on the original 1876 flag (following the ending of the country's isolation from the West) was formally adopted in Jan 1950. The QTH Seoul is the South Korean capital city, having a population of over 10 million. It lies only about 50 kilometres from the de-militarised buffer zone to the north.

Amateur radio activity from South Korea has been considerable except for a brief period in the 1950s during which radio contact with the country was banned (This ban was lifted in October, 1957). Such activity has been due to the presence of US personnel and the particularly large growth in the number of Korean stations, especially clubs operated by Korean nationals One is surprised at the particularly high quality and variety of QSLs emanating from the KARL bureau in recent years.

Reports of contacts with stations in North Korea using the allocated Ps, P9 prefixes have continued throughout the 1980s and into the 1990s, but the status of such stations (if not piratical) is unknown. Many DXers are hopeful of the granting of new DXCC status but the attitude of Government to amateur radio licensing in that country must first be determined. Only as recently as July 1991 the South Korean President, Roh Tae-woo told President Bush that he hoped to see the two Koreas reunited before the turn of the century. Hopefully we will be in QSO with the Democratic People's ROK long before that time.

Thanks

The WIA would like to thank the following for their contribution of QSL cards.(supplementary list)

Ken	VK5IT
Jim	VK9NS
Mike	VK6HD
Pat	VK3ADN
Wally	VK3MJ
Marilyn	VK3DMS
Vic	VK5AGX
Dick	VK3ABK
Stan	VK3TE
Ken	VK3WM
RObin	VK6LK
Harry	VK4KW

Also, the friends and family of the following "silent keys" (supplementary list)

Harry Jupp VK2AJU
(courtesy of Graeme VK2GJ)
Jack Bailey VK4JC (courtesy of VK4AZ)
Jim Brinkman VK2IS
Alex Murray VK2FM

DX QSL Contributors' Ladder 1991

Mike	VK6HD	164 points
Jim	VK9NS	56 points
Steve	VK3OT	30 points
Robin	VK6LK	29 points
Mavis	VK3KS	17 points

If you, the reader would like to play a part in contributing to the WIA Collection, please contact the writer of this series of articles.

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CLUB CORNER

Shepparton 1991 Communications Day

The 1991 Shepparton Communications Day will be held on Sunday 22 September. The event is organised by the Shepparton and District Amateur Radio Club. After a break last year the club is out to make this event the best yet.

A wide range of the newest items on the amateur shopping list will be on show as indicated by the positive response received from traders and distributors. There will also be displays which do not relate directly to amateur radio, but which will prove interesting to all.

Dust off that surplus and unwanted gear, as there will be plenty of room to help you dispose of it. You may wish to drive your trailer up and sell from it in our undercover parking. First in, best dressed, in this area.

As many amateurs travel from Melbourne and interstate, it has been decided to upgrade the catering. A sit-down meal will be available for those who wish to participate.

Keep an ear on the Thursday night club broadcast on VK3RGV 146.65MHz at 8pm local for more details. Any traders who have not been contacted and may wish to participate can contact the club by mail, PO Box 693, Shepparton 3630.

Shepparton is located on the Goulburn Valley Highway, 180km north of Melbourne. Mark it in your diary now: Shepparton's Communications Day, Sunday 22 September.

Old Timers Club (SA)

VK5 Old Timers' Luncheon will be held at Marion Hotel, Marion Road, Mitchell Park on Tuesday 29 October 1991 from 12.30pm (pay as you go as last year). Ladies' Luncheon will be held at the same time.

RSVP 15 October 1991 for catering.

Please notify Ray Deane VK5RK 271 5401, John Allan VK5UL 344 7465, or Jack townsend VK5HT 295 2209.

For those travelling by bus, catch No 243 in King William Street (stop 24).

Southern Electronics Group

From 28 September to 11 October, Albany, Western Australia will be celebrating the 200th anniversary of Vancouver's landing, when he claimed possession of the western part of Australia in the name of the British Crown.

Amateurs in Albany will participate and mark the occasion by operating the club station of the Southern Electronics Group on all bands (and a variety of modes) during the period of the celebrations. The special event callsign VI6SR is hoped to be used, and a suitable QSL card will be sent to all amateur stations which QSO with the club station.

The amateur fraternity of Albany look forward to working you during the celebrations. Please call in.

Bevan Lang VK6VX
Hon Sec
c/- PO Box 738
Albany WA 6330

Townsville Amateur Radio Club (Inc)

North Queensland Radio Convention 1991, James Cook University, Townsville, 27, 28, 29 September.

Convention Information

Venue: The Convention is held at the Western Campus, James Cook University, located approximately 11km from Townsville City Centre in the foothills of Mt Stuart.

Transport: There is no public transport out to the campus, however TARC members will gladly help delegates with their transport needs.

Accommodation: Billeting with friends is popular, as many avid conventioners use the weekend to catch up with what is happening up in the north. There is also accommodation available on campus at a cost of $42.50 per person per day, which includes full board and morning and afternoon teas and lunch.

Registration: Final date for return of the registration forms and payment is 21 September 1991. If you are going to attend such functions as the buffet dinner, then registration before the final date is essential to ensure your participation.

Contact Info: A watch will be kept on the club's Mt Stuart repeater VK4RAT 146.7MHz up to and during the convention weekend. If you find you need information ... yell for it! For information up to the convention weekend contact Peter Harding VK4PVH (077) 79 0300 BH, (077) 73 3487 AH; Roger Cordukes VK4CD (077) 79 0266 AH, (077) 74 0211 AH; Bob Mann VK4WJ (077) 81 4450 BH, (077) 79 7869 AH; Gavin Reibelt VK4ZZ (077) 74 1102 BH, (077) 79 1161 AH, or write to the Secretary, TARC (Inc), PO Box 964, Townsville Qld 4810. Or grab a TARC member on the air or in the street!

Daily Highlights

Friday 27, evening: 1930-2200 the Greetings Evening. Informal get-together at the Newpark Hotel. Drinks at bar prices, light supper and nibblies provided.

Saturday 28, morning and afternoon: From 0800 open for convention registration * radio-sporting activities * car park treasure bazaar * trade, home brew and demonstration displays * at 1300, official opening by John Nutting, manager ABC Radio 4QN Townsville * technical lectures by Keith Kikkert * ladies' magical mystery tour.

Evening: buffet dinner at the Showground Function Rooms with music provided by Thunderbolt, the band of renown, along with the famous Amateur Hour.

Sunday 29, morning: from 0800 * more radio-sporting activities, trade, home brew and demonstration displays * at 0900, WIAQ news rebroadcast and call-in sessions * ladies visit to attack the local markets * technical lectures by John Nichols * judging of the home brew contests * presentation of trophies.

Afternoon: the legendary NQ convention auction * more radio-sporting activities, trade and demonstration displays.

Special Attractions

Amateur Hour: So you thought that radio enthusiasts only dabbled with that boring radio stuff! Be part of it, too! Get out those glad rags and put on a voice and be in the famous Saturday Night Amateur Hour.

Sunday Auction: The Legendary NQ Convention Auction! Will you be one of many to score the find of a lifetime? Will you have to leave the kids behind to make room for the booty? Bring a loud voice and lotsa dBs.

Car-Park Bazaar: So it hasn't been called

JUNK yet, but you still have to make room at home for all the good gear you will get at the Sunday Auction. Load it into the boot of your car and participate in the Saturday Morning Car-Park Bazaar. The only rule is that nothing is left on site when the bazaar ends!

Technical Lectures: The finest minds in the form of Prof Keith Kikkert and John Nichols will spellbind you with insights of the world around us, and how those discoveries are put to use on a day-to-day basis.

Radiosporting Activities: If you don't know what Radio Sporting is all about, then you will get a fair idea at the convention, participating in the activities and iwth an active demonstration by the TARC RadioSporting team that recently competed in China.

Trade Displays: Exhibition of some of the finest radio equipment and services available in Australia, with some of the displays providing hands-on working participation.

WIAQ Bookshop: Bring your money with you for, apart from the Saturday Auction and Saturday Car Park Bazaar, the Bookshop is one of the more popular places to displace dBs at the convention, and is well stocked with popular references.

Ladies' Activities: Apart from activities away from the convention site, the ladies are well catered for by a very active Ladies' Convention Group, keeping you well entertained while you keep control of hubby's spending urges.

Homebrew Contest: Bring along that gizmo you've made out of recycled bits, it might win you a prize! Entries open to all attending, with sections being Technical, Non-Technical, Ladies, Children. The entries don't have to be high-tech or expensive; winners can be simple yet ingenious.

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SPOTLIGHT ON SWLING

Robin L Harwood VK7RH
52 Connaught Cres West Launceston 7250

Well, spring has arrived by now. Already the propagation has altered and the higher frequencies are coming in later in the evenings. Daytime propagation of HF signals from Europe is dropping off around midday until later in the afternoon and early evening. Don't forget that Continental Europe will go off Daylight Time on Sunday 29 September. This will mean that directed programming to audiences there will be aired one hour later.

Also, the USSR will revert its local time by one hour on the same date. This European summer, the Soviets did not have Daylight Time because they suddenly realised that Stalin had introduced Daylight Time in the '30s, but had forgotten to revert the clocks. In effect, they were on double Summer Time when the USSR reintroduced Daylight Time in the '70s. That is why the alteration has been made.

While we are on Daylight Time, it appears as if some sanity has at last arrived here in Australia. It now looks as if we are going to have a standard date for the commencement of Summer Time in VK. The Tasmanian Government has legislation that would mean the earlier implementation of it - early in October until late in March, which is out of step with the mainland states. But I believe that federal legislation is presently before the Senate which will override state legislation, and it does seem that we will all have the same period of Summer Time. VK8 will be coming on to it, after remaining on Central Standard Time. Yet, some trans-Tasman travellers are going to be confused in October, because NZ will introduce Daylight Time earlier than in Australia.

Recently, I have made a cautious return to 27MHz CB, after 15 years absence. I obtained an AM/SSB Super Jaguar Mark II from a family member's mobile that was no longer required. I have, from time to time, occasionally monitored 27MHz on the Icom, but have not had the inclination to go up there, ever since it was taken away from us in 1977. Fifteen years on, things haven't changed too much, although the personnel have.

The reason that I have returned to 27MHz is that our local WIA branch has commenced a novice course, using the Gladesville Amateur Radio Club videos. Many of the course attendees come from the CB ranks. This was due to the enthusiasm of one of the newer CB operators, who had other CBers doing the course. Therefore, I have found it has been very useful assisting them with the theory via CB in between classes.

It has been an interesting experience back on 27MHz. There are genuine people there, who are only too willing to learn and upgrade to the novice licence. Sadly, there have been isolated instances where other operators have delighted in denigrating and ridiculing amateur radio on air. Fortunately, they are in the minority, albeit a vocal one. But, it should be remembered that 27MHz CB is not amateur radio, being a public access band. Yet, it could still be a good recruiting ground for prospective candidates for amateur radio.

Now for some DX news. I recently came across the External Service of Radio Bangladesh in English. It was on 15208kHz at 1230 UTC. The modulation was poor and the signal was hard to separate from nearby channels. Reports indicate that the station is erratic in operation, so it may not always be there. It may also vary in frequency, as they announce that they are on 15200kHz, so you may have to tune around that channel to find it.

Well, that is all for this month. Until next month, the very best of DX and 73 - de VK7RH.

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OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

Help Wanted

I am a WWII signaller who collects and restores military visual/line and radio equipment as a non-remunerative hobby.

Sincere thanks to the many amateurs and members of signals organisations for their help, especially with information and manuals to restore equipment to its original condition.

Although I have tried, I have not been successful in obtaining the following information, which is badly needed to speed restoration, or for the operation, of some units.

1. **Parts List** for Australian Army 128 manpack battery operated wireless set 2-4.5MHz. The sets I have have been heavily tropic-proofed, and component values are difficult to read. Sets were probably made by Radio Corporation Melbourne in 1946.

2. **Details and circuit** of PRC10A, 12V DC(ds) transistorised power supply. The PRC1OA is a US Army manpack battery operated wireless set 38-55MHz FM. It was used by the Australian Army in 1960/70. The 12V transistorised supply is mounted in a case that clips on the bottom of the set in place of the normal batter case which holds the 1.5V and 135V batteries. This supply could be a special made in Australia.

3. **Operating Instructions** for approximately 150mm Navy type Aldis signalling lamp (lantern Admiralty pattern o 5110D). The lamps use a trigger operated tilting mirror to signal in Morse. The lamps are lent from time to time, and I wish to conserve the small quantity of bulbs I have (12V 36W) by proper handling.

If someone could help me, I would be very grateful.

EVAN FELL VK4EF
97 JUBILEE TCE
BARDON QLD 4065
PH: (07) 366 1803

Murphy or Marcolins?

Congratulations to *RAAF Williams (alias Laverton) and its amateur radio club VK3APP on their valiant efforts to communicate with STS-37 "Atlantis" (*AR* June 1991, pp 22-23).

The article warmed the cockles of the hearts of those of us who battled with AT5-AR8s or the RAF equivalents, in a variety of aircraft types.

Obviously Marcolins are still with the communicators.

Ignorant pilot types and non-W/T erks can brush up on the subject by referring to four articles in TEE-EMM-Volume III p173, p231, Volume IV p18, p76.

The sugar-coated pills labelled "mind your Marcolins" may have less application in these days of solid state, but the underlying principles still apply.

ALAN GARDNER VK4BWG
40 WATTLE AVE
BRIBIE ISLAND 4507

It's Worth the Effort

Re: Morse Code (Morse is really easy; you only have to listen to it)

Well, you all do not know what to expect if you drop the Morse code.

You will be swamped with CBers wanting to have a bit of fun. Without Morse code, examinations will be too easy, and you lose a good filtering medium.

Many of you are ex-Signal Corps members or amateurs brought up by some other amateurs and do not really know what's going on 27MHz today.

Well, I know, because I graduated from CB to my licence, and I know which remarks regarding today's examinations are made and why only the keenest are deciding to go for amateur licence - Morse is the answer why yahoos and those who only want to have fun do stay away.

I am not an electronic person at all, and I am not interested in repairing, modifying or experimenting with radio equipment. I just want to operate and have DX contact with my friends in Europe. But to have that, I just about learned the whole of Fred Swainston's book from back to front to get my licence. Theory is very hard and a huge obstacle for me, but I still want to get my full call also. So I am still doing the same thing, and I am not complaining about how hard it is, because if you **really** do want something, you'll get it.

So, for all of you who complain how hard is the Morse code, for goodness sake, stop complaining. Sit down on your rear end and start listening to the Morse, and you'll get there.

THOMAS KNOPP VK3MEY
PO BOX 454
NOBLE PARK 3174

More on Amalgamation

I wish to say a few words re the amalgamation of *Amateur Radio* with *Amateur Radio Action*.

I am totally opposed to such a move. In my opinion, the magazine *Amateur Radio* is the Institute's way of keeping the members informed of ham news and activities, as not all of us can listen to the various Sunday morning WIA broadcasts.

I realise, of course, that unlike broadcasts, the magazine cannot be used as a calendar for forthcoming WIA activities at short notice.

I have been a member of the WIA since 1947, and to think of a possible amalgamation with another magazine would be a very backward step.

The magazine plays a very important part in WIA activities, and it is essential that it remains the Institute's monthly publication.

The magazine has really developed over the years.

LONG LIVE *AMATEUR RADIO*.
MAC HILLIARD
12 JARRETT ST
CAMPSIE 2194

Memories of the War

I am very pleased with the way the magazine is going, and the choice of material.

I have so far built up a little impedance bridge and SWR meter with great delight, and have made good use of these two devices in restoring four of my FT200s.

I am also writing for my father, who was with 2/11th AIF through the Middle East, and then on return New Guinea and then went on to M/Z Special Forces.

This involved work through the Solomons and with the Krait - sub Swordfish etc, etc.

My father lost many of his men, lived off virtually nothing for months on end and was, in most cases, not allowed to make contact with the Japanese.

They had to relay important information only, and they had to carry heavy radios up and over very high mountains through the night, with many casualties.

In one case, 38 men went on a mission, and not even half were picked up when the subs and Catalinas returned.

But the main thing is, my father survived and is very pleased and grateful that your magazine has remembered their efforts in keeping Australia free from what other countries suffered in WWII.

MAURIE STONEHOUSE VK6NST
AND FATHER
SYDNEY STONEHOUSE
140 MEDINA AVE
MEDINA 6167

(May we hope that because of the sacrifices of men like your father the world may never again suffer as in World War Two. Ed).

Skydivers

Referring to "The Balloon Goes Up" July *AR* p25. A very knowledgeable and interesting article. However, marred a little perhaps by the part about the parachute back to earth ("not packed like a skydiver's chute!!").

The article was shown to a few skydivers and, yes, "the balloon did go up".

I think your correspondent should stick to technicalities and leave the so-called funny bits to comedians.

DOUG FOWLER VK4AVR
50 RYHILL RD
SUNNYBANK HILLS 4109

Amalgamation?

I am interested to read that it has been suggested to you that *AR* should amalgamate with another magazine. I write to say that I do not think such an amalgamation would be a satisfactory long-term solution to our problem.

An organisation of which I have been a member since 1950 and which has published a monthly bulletin since October 1973, had 22 issues published as part of a commercial magazine in the 1948/50 period. This experiment did not prove satisfactory and the organisation returned to publishing its own bulletin as before.

Our object is to increase membership and what is published in *AR* is "preaching to the converted".

I put forward the suggestion that a series of articles be prepared covering the history of the WIA itself, with particular reference to, and emphasising, the successes WIA has had in dealing with national and international problems to the advantage of the Australian amateur, and also to the failures due to lack of membership. These articles to be published in other radio magazines such as *Electronics Australia* and *Amateur Radio Action.*

I know that block advertisements appear in those magazines from time to time, but I fear no one bothers to read them and, in any case, they do not make enough of the advantages of membership.

I spoke to Bill Roper along these lines at the NSW Divisional Dinner on 28 June.

A Franklyn Pain VK2DYP
16 Opala St
Belrose 2085

Local Book Source

Copies of *QTC* (I have a message for you) are available in Australia through A H Sandilands VK2BS, 10 Nelligen Place, Nelligen NSW 2536 at $A27.80, softback, and $A35.20, hardback, in each case, plus postage for parcel of about 900g.

This avoids the inconvenience and costs of organising international drafts through banks, or international money orders through post offices. And delays involved in the book coming through from the United States by mail.

Ian D Compton VK5KIC
9 Craig St
Richmond 5033

CB and Amateur Radio

Just a few lines of encouragement for the Sydney Radio Group VK2SRG; at last one club is dong something constructive, combining CB and amateur radio activities together in the same club.

I have spoken to my fellow amateurs many times that this sort of involvement should be adopted by amateur clubs; however, the Sydney Radio Group has started in the reverse, but still with the same objective. Congratulations.

This is most certainly a good move. For example, using the figures provided by VK6NE June issue, "DoTC statistical summary for March 1992", 19,392 amateurs, 418,551 CBers. Now, if only one half of a percent of licensed CBers joined the ranks of amateur radio operators, they would swell our ranks by 10 per cent; not a bad increase. These are only conservative figures.

Now, before all you knockers put pen to paper, stop and think carefully, where did you and your close amateur friends progress from?

Chris Peake VK3XCP, VCJ342
3 Goulburn Court
St Albans 3021

More for the Disabled

Thank you for publishing my article on Steven Frith (June *AR).* It has given me great pleasure showing it to my friends.

I received letters from two readers of the article, VK4LR Rex Newsome, and VK2DVH Jack Heath, and have had further interesting correspondence with them both.

Would you be interested in a series of follow-up articles on Steven Frith? They would include details of communication difficulties and problems encountered, and the way these were solved with a computer, and the eventual changing over to a speech processor. The method of operating a computer with a single switch required some unusual programming routines, and these could be interesting to computer programmers and also to those who may wish to help the disabled.

The amateur movement has a large pool of skilled persons who can help the disabled. People with communication and computer knowhow, retired people with time on their hands and the ability to use their hands to make specialised items that cannot be bought off the shelf. It can be a wonderful challenge, helping the disabled, and each case undertaken is so different. There are no monetary rewards, only a very special satisfaction that cannot be measured in money. It is for these reasons that I wish to let your readers know about the work we are doing. As for myself, at 81 years of age I feel that my remaining years are being very well spent.

Karl Saville VK5AHK
1290 North East Rd
Tea Tree Gully 5091

(Thank you very much, Karl, for the promise of further articles. We look forward to seeing them. Ed)

VK4 Slow Morse

Thank you for printing my letter attempting to correct the timetable for Slow Morse transmissions in VK4 *(AR* August 1991). You did print what I sent word for word, except for one line. Astute readers would have wondered why TARC has two callsigns - not so - that line should read:

Wednesday Central Highlands Amateur Radio Club VK4WCH

However, just when we are starting to get it right, there are changes in the wind . . . The possibility of a new station, and the coming once more of the dreaded Daylight Saving! So, devoted followers of the VK4 Slow Morse sessions, drop in on 3535kHz around 8pm on Monday, Wednesday, Thursday or Sunday, and ask the operator on duty for the latest update.

Sally Grattidge VK4MDG
VK4 Slow Morse Co-ordinator
Townsville 4810

Magazine Future

Reference your July editorial about *AR* amalgamating with a commercial magazine. That must never happen; we can and must survive as an independent non-profit organisation. *AR* must not become a media subsidiary.

Ray Jones says we must be "market driven" - we are "driven" by our members, who number 41 per cent of the Australian radio amateur population. That is our real performance indicator; indicating what those 10,000 non-members think of us - our service, our officials, our members as a group, and our members as individuals.

Sure, our business performance is good - the *AR* production operation is financially good, using only 37.5 per cent of our subs income. Does the quality of *AR* content impress non-members? What happens to the other 62.5 per cent of subs income?

One division has a remarkable business performance for a non-profit service organisation - soon it will not need subs income and could even stop pretending to provide service. *(Would you care to elaborate, Lindsay?* Ed)

We have reason to be proud of our successful operations, but it is not what we think of ourselves that counts. What does that 59 per cent think? Why don't we ask them? Invite their comment, suggestions and articles for *AR.* Don't threaten them with extinction if they don't join us; we need members who want to be members, not conscripts. *(Hear, hear!* Ed)

Lindsay Lawless VK3ANJ
Box 112
Lakes Entrance 3909

Amalgamation Again?

Amalgamate with (translation: "be swallowed by") *ARA?*

Not "My Fair Lady" likely!

I'd sooner see us amalgamate with *Women's Weekly!* Throughout its short history "that" magazine has taken shot after shot at the WIA, most of them unwarranted, all of them spiteful. They want *AR* out of the field so they can have a monopoly. I've worked in the magazine industry, and have studied many publications in radio and other fields. Amalgamation such as "The Jones Boys" advocate will see *Amateur Radio* die a not very slow death.

First, it'll be a 16-page liftout; then, in a few short months, eight pages, and eventually it'll be stuffed away at the back of the magazine with perhaps one page only.

What became of the rumour that we were negotiating with *Electronics Australia*? If we must join forces with someone, let it be that magazine.

It has always had a sympathetic attitude towards our hobby, has had (and still has) many VKs on its staff over the years, and amalgamation with that prestigious publication would be a feather in the WIA's cap ... not an abject surrender to a vicious competitor.

Amateur Radio is not without its faults, but at least it is the voice of the WIA.

HARRY ATKINSON VK6WZ
5/97 RAILWAY PARADE
MT LAWLEY 6050

Thanks from Germany

During my trip around the world from 18 October 1990 to 2 April 1991 I visited Australia for about 10 weeks from 15 Jan to 28 March 1991.

In all my years of activity I had worked more than 1000 different VK stations, so I had many friends there. It was a great pleasure for me to see so many of my old and new friends in VK in person. Sorry I could visit only VK2, 3, 5, 7 and 8, but in all places I had a very warm "welcome", and the time was gone so quickly.

It was very interesting for me to make QSOs, especially with Europe, from this part of the world under my guest licence call VK3ETA. Special thanks to Walter VK3DFO, who helped me to get the licence, and also to George VK3LA, from whose station I could work my skeds with Germany.

I wish my friends in beautiful Australia all the best. I look forward to many more good QSOs, and I hope to visit VK again soon. Many thanks to all!

DF4DI (also Y24EA) Op: Gun; QTH: Rostock/Baltic Sea

GUN DF4DI, VK3ETA & Y24EA
GÜNTHER KOCHNIß
STEPHAN-JANTSEN-RING 26
2520 ROSTOCK 26
GERMANY ar

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

Tom Coakley VK3IU

T J Coakley spent a lifetime on the engineering side of aviation. He did his "apprenticeship" with the RAAF at Point Cook in the early 1920s, and then went to Adelaide where he was with early aviation companies at Parafield and the Aero Club of South Australia.

In the 1930s, with Guinea Airways, he specialised in Lockheed 10s, 12s, and 14s. At times, he acted as radio operator on Guinea's aircraft on the Adelaide-to-Darwin run and was known to operate airborne mobile on 7MHz. He held the call VK5UK from the early 1930s.

In the late 1930s, he moved to Melbourne, became VK3IU, and joined Australian National Airways in an engineering capacity; then to the Department of Aircraft Production during the War. He joined Trans Australia Airlines very soon after its formation (1946) and spent many years with TAA on the procurement of new aircraft until his retirement.

Tom was a very active fellow for his age and, after TAA, joined Ansett Airlines of Australia dealing with aircraft maintenance matters. In his latter years, he was an aircraft accident assessor for an insurance company.

Tom was a CW man, and the call VK3IU was rarely heard on phone during the 52 years he held the call.

Tom Coakley died on 27 June 1991 at the age of 87 years.

VALE, DIT DIT DIT DIT DAH.
VK3PF AND VK3TJ.

Don Thornley VK5NOD

With sadness, I write to report the passing of our dear friend Don VK5NOD. Don passed away on 22 March 1991 at the age of 56, following a short illness.

Don opened his station with his novice licence on 4 February 1980, followed by his attaining a limited licence several years later.

He enjoyed contests, DXing and a good ragchew on the 15 and 80m bands.

He was a member of the WIA, and a member and past president of the South East Radio Group (SERG).

Don will be sadly missed by his wife Mary, family and his many friends.

GRAHAM D ROESLER VK5YM

Mr A Hartley	VK2ALI
Mr B I Henderson	VK2DFH
Mr I Hands	VK2IBH
Mr R B Russell	VK3BR
Mr T Coakley	Ex VK3IU
Mr S Maidment	VK3DCA
Mr S Manhire	Ex VK3PJX
Mr B Wishart	VK4WX
Mr E Wissemann	VK4ADA
Mr R K N Wilkins	VK5AUR
Mr K Ring	VK5KH
Mr J Kitney	VK6AV
Mr J Vogel	VK6BA

Please note: Mr Jack Trevena VK2APT was wrongly listed as a Silent Key in the August issue. Our apologies to Jack, and we regret any distress or embarrassment caused by our mistake.

Stephen Maidment VK3DCA

Steve died on 17 July 1991.

He was a tireless worker for St Leonard's College where he was a teacher, and for the local Scouts as leader of the 7th Cheltenham Troop. Through the Jamborees-on-the-Air which he organised, some 20 local Scouts and leaders have gone on to gain their amateur licences.

Steve was active on VHF packet and phone, and would often be heard chatting with his

father Len VK3NJE on the local repeaters. To Len and his wife Wilma, on behalf of Steve's many friends in amateur radio, I offer my condolences.

An exceptional young man who would give freely of his time to any who asked, Steve will be greatly missed.

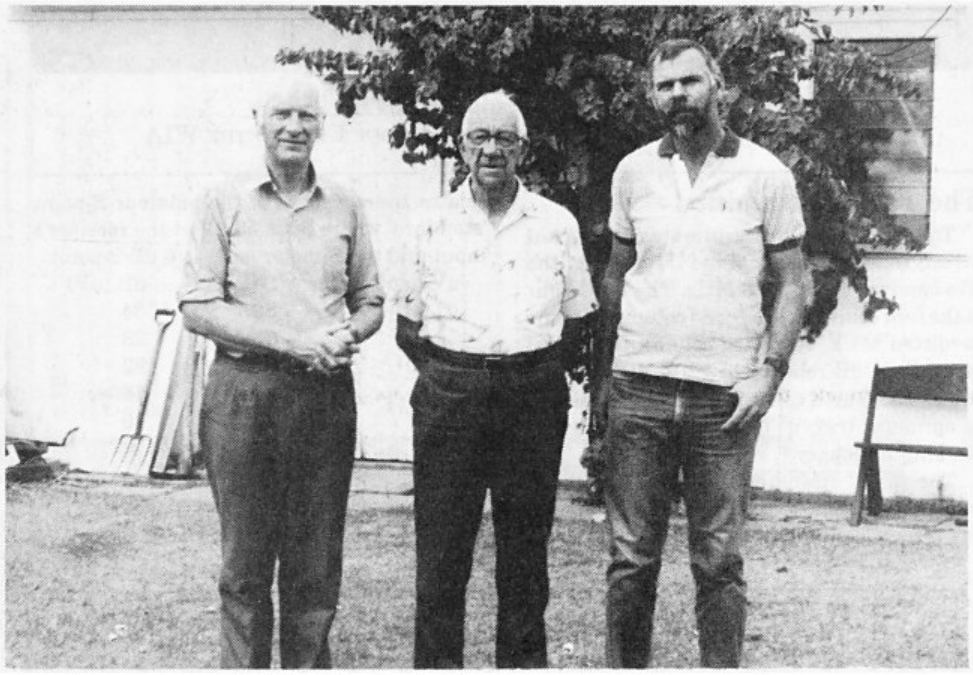
CRAIG MCMILLAN VK3CRA

Jack Kitney VK6AV

Born 10 January 1904 - Died 19 July 1991

At the age of 14, Jack became interested in things electrical, and later in the then newly talked-about radio. In 1924, he was receiving the old 6WF transmissions on a crystal set, using a long-wire antenna. This was considered marvellous, as his location was some 170km to the south of Perth. His interest in obtaining an experimental licence was interrupted by the declaration of war in 1939, and it was not until July 1949 that he came on the air with the call VK6AV. He was very interested in CW operation, and was later amongst the earliest to change over to SSB. However, he maintained a balance between the two modes of operation.

His livelihood was that of an orchardist, and he went into retirement at about 60 years of age to further pursue amateur radio and fishing. He was also an accomplished musician with either the violin, or saxophone - which he preferred. Jack's XYL predeceased him by two years, and he leaves two sons. One son is Vic VK6BK, and a grandson Roger VK6VK.



Three generations of the Kitney family. L to R: Vic VK6BK, the late Jack VK6AV and Roger VK6VK. Photo taken in June 1989.

VIC KITNEY VK6BK. ar

HF PREDICTIONS

ROGER HARRISON VK2ZTB
GENEROUSLY SUPPLIED BY THE APOGEE GROUP FREE TO THE WIA

The Tables Explained

The tables provide estimates of **signal strength** for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column, the second column lists the predicted MUF, the third column the signal strength in dB relative to 1 uV (dBU) at the MUF. The fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency.

The signal strengths are all shown in dB relative to a reference of 1 uV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point 'standard' where S9 is 50 uV at the receiver's input and the S-meter scale is 6 dB/S-point.

uV in 50 Ohms	S-points	dB (uV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	-2
0.39	S2	-8
0.2	S1	-14

The tables are generated by the Graph-DX program, assuming 100 W transmit power output, modest beam antennas (e.g. three-element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST. The major part of NSW and Queensland.

VK SOUTH. Southern-NSW, VK3, VK5 and VK7.

VK WEST. The south-west of West Australia.

GraphDX is written in the C language and runs on any IBM PC AT/XT or compatible computer with Hercules, CGA or VGA adapter and screen. Enquires to FT Promotions, PO Box 285, Balmain NSW 2041. **ar**

VK EAST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.8	3	12.8	-2	4	3	-2	-11
2	16.8	-2	12.7	-10	0	0	-3	-11
3	21.1	1	15.9	-21	-4	1	1	-2
4	27.5	4	21.1	-33	-9	0	4	4
5	32.4	5	25.3	...	-12	-2	4	6
6	32.4	5	26.5	...	-13	-2	4	6
7	31.8	5	25.8	-39	-12	-1	4	6
8	30.5	5	24.5	-33	-8	1	5	6
9	29.0	7	24.4	-22	-2	5	8	7
10	27.1	9	21.6	-9	5	9	10	7
11	25.5	11	20.2	1	11	13	11	7
12	23.8	13	18.9	12	17	16	12	6
13	22.5	17	17.8	23	23	19	13	5
14	21.3	21	16.9	31	26	21	12	2
15	19.9	23	15.9	35	27	20	10	-1
16	18.5	25	14.5	35	26	17	5	-8
17	17.5	26	13.6	35	24	15	2	-13
18	15.9	28	12.3	33	21	9	-5	-22
19	14.2	29	11.0	29	15	2	-15	-35
20	15.1	28	11.5	31	18	6	-10	-28
21	19.7	24	15.5	37	28	20	9	-2
22	21.1	23	16.3	32	28	23	14	5
23	18.9	18	14.5	19	18	14	7	-3
24	19.5	12	15.0	9	13	11	5	-3

VK STH - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.3	9	13.3	5	9	6	-1	-11
2	17.1	2	13.0	-4	3	2	-3	-11
3	21.5	3	17.0	-16	-1	3	2	-1
4	28.3	5	21.8	-29	-6	1	5	5
5	31.6	5	26.0	-37	-10	0	4	6
6	31.3	4	25.9	-39	-12	-2	3	5
7	30.9	4	25.2	-39	-12	-2	3	4
8	29.9	4	24.1	-35	-10	0	4	4
9	28.1	5	22.5	-26	-5	2	5	5
10	26.2	6	20.7	-15	1	6	7	4
11	23.4	7	18.5	-5	6	8	6	1
12	21.1	10	16.6	6	11	10	5	-2
13	18.9	14	14.9	16	15	10	2	-8
14	17.2	19	13.6	23	17	9	-2	-16
15	16.0	23	12.7	27	17	7	-7	-24
16	15.3	25	12.0	28	16	4	-12	-30
17	14.5	26	11.3	27	14	1	-17	-37
18	14.1	28	10.9	27	12	-1	-20	...
19	13.3	29	10.2	25	9	-6	-27	...
20	12.6	29	9.6	23	6	-10	-33	...
21	13.9	28	10.5	27	12	-2	-22	...
22	17.7	24	13.3	32	23	13	0	-14
23	18.2	21	14.0	26	21	15	5	-7
24	20.6	16	15.9	19	19	16	9	0

VK WEST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.8	14	12.1	15	11	3	-8	-23
2	15.7	7	11.9	6	6	1	-9	-21
3	19.6	5	15.5	-4	4	5	0	-6
4	25.7	6	19.7	-15	1	6	6	4
5	29.9	5	22.7	-24	-3	4	7	6
6	29.6	5	24.7	-28	-5	2	5	5
7	29.4	4	23.8	-29	-6	1	5	5
8	29.1	4	23.8	-28	-6	2	5	5
9	28.4	5	23.0	-24	-4	3	5	4
10	27.0	5	21.7	-17	0	5	6	4
11	25.5	7	21.5	-7	6	9	8	4
12	23.4	10	18.6	5	12	12	8	2
13	21.7	14	17.2	16	18	14	8	0
14	20.0	17	15.8	25	21	15	5	-6
15	18.7	21	14.8	31	23	14	2	-11
16	17.6	23	13.9	31	21	11	-2	-17
17	16.6	24	13.2	31	19	8	-7	-24
18	15.6	26	12.2	30	17	4	-13	-32
19	15.0	26	11.7	29	15	1	-17	-37
20	13.8	27	10.7	26	10	-5	-26	...
21	12.6	28	9.7	22	3	-13	-37	...
22	13.6	27	10.4	25	9	-7	-28	...
23	17.6	24	13.9	34	23	12	-2	-17
24	17.4	22	13.5	28	21	13	1	-12

VK EAST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.6	3	10.4	1	4	2	-5	-15
2	15.2	6	10.3	5	6	2	-6	-17
3	14.5	9	10.0	9	7	1	-8	-21
4	13.7	13	9.5	13	8	0	-13	-28
5	13.7	17	9.7	16	9	0	-14	-30
6	14.4	21	10.3	21	13	3	-10	-26
7	17.4	22	12.7	27	20	13	2	-10
8	21.4	19	15.6	26	23	19	12	3
9	17.9	16	13.7	16	15	12	4	-4
10	17.1	9	13.0	5	9	7	1	-7
11	16.8	1	13.2	-4	3	2	-3	-11
12	15.6	-6	12.3	-11	-1	-1	-5	-13
13	14.7	-12	11.6	-15	-4	-3	-6	-13
14	13.9	-18	10.9	-17	-5	-3	-7	-13
15	13.4	-22	10.4	-18	-5	-4	-7	-13
16	12.6	-37	9.7	-25	-12	-10	-13	-21
17	12.0	...	9.1	-31	-17	-15	-20	-28
18	13.2	-28	10.0	-22	-8	-6	-9	-15
19	16.8	-12	13.2	-25	-8	-4	-4	-8
20	21.9	-2	16.2	-30	-10	-3	-1	-2
21	21.2	-1	14.4	-25	-6	-1	0	-2
22	19.1	-1	12.9	-16	-2	0	0	-5
23	17.7	0	11.9	-9	1	2	-1	-8
24	16.7	2	11.2	-3	3	2	-2	-10

VK STH - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.7	0	10.1	-1	2	-1	-9	-19
2	14.2	3	9.9	3	3	-1	-11	-24
3	13.6	7	9.5	7	4	-3	-15	-30
4	12.8	11	9.1	11	4	-6	-21	-38
5	12.8	15	9.3	14	5	-6	-22	...
6	13.5	19	9.9	18	8	-3	-19	-37
7	16.0	21	11.9	24	16	7	-5	-20
8	19.4	20	14.4	27	22	16	7	-4
9	19.7	16	13.7	21	18	14	5	-4
10	17.7	12	12.2	12	12	7	-1	-11
11	15.8	5	10.9	3	5	1	-6	-17
12	14.8	-2	10.1	-3	1	-1	-9	-19
13	13.9	-9	9.7	-8	-2	-3	-9	-19
14	13.1	-16	9.1	-11	-3	-4	-9	-18
15	12.5	-28	8.8	-18	-8	-8	-13	-22
16	11.8	...	8.4	-52	-20	-19	-25	-36
17	11.5	...	8.3	...	-26	-26	-32	...
18	12.7	...	9.2	-34	-19	-17	-21	-29
19	15.4	-17	10.6	-24	-8	-4	-5	-10
20	19.7	-7	14.6	-32	-11	-5	-3	-5
21	20.2	-6	14.1	-31	-11	-4	-2	-5
22	18.2	-6	12.6	-23	-7	-3	-3	-7
23	16.8	-5	11.6	-15	-3	-1	-4	-10
24	15.8	-3	10.9	-8	0	0	-5	-14

VK WEST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.2	-11	9.9	-11	-4	-5	-11	-19
2	13.7	-8	9.6	-6	-2	-5	-13	-23
3	13.1	-5	9.3	-2	-1	-6	-16	-28
4	12.3	-2	8.9	0	-2	-8	-20	-35
5	12.4	2	9.0	4	0	-9	-22	-38
6	13.1	6	9.6	6	1	-6	-20	-35
7	15.4	11	11.5	11	7	1	-10	-23
8	18.5	13	13.8	15	13	8	0	-10
9	21.4	13	16.0	16	16	13	7	-1
10	21.8	11	14.9	13	15	12	6	-1
11	19.4	7	13.2	5	8	6	0	-7
12	17.4	1	11.8	-4	1	0	-4	-12
13	15.6	-6	10.5	-10	-2	-3	-8	-16
14	14.6	-13	9.8	-15	-5	-5	-9	-17
15	13.8	-20	9.4	-17	-7	-6	-10	-17
16	13.0	-32	8.8	-24	-12	-10	-14	-21
17	12.4	...	8.5	-35	-21	-19	-23	-31
18	11.6	...	8.1	...	-28	-27	-32	...
19	11.3	...	8.0	...	-31	-29	-35	...
20	12.5	...	9.0	-34	-20	-18	-22	-30
21	15.3	-19	10.2	-25	-10	-6	-8	-13
22	17.6	-12	12.4	-28	-11	-6	-6	-10
23	16.4	-13	11.4	-23	-9	-6	-7	-12
24	15.3	-12	10.7	-17	-6	-5	-8	-15

APOGEE ARTS

REPEATERS - ADDITIONS, DELETIONS, ALTERATIONS. HAVE YOU ADVISED THE WIA OF CHANGES NEEDED TO THE REPEATER LIST?

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.9	8	10.9	7	6	0	-11	-25
2	14.1	2	10.8	2	3	-1	-10	-23
3	14.5	-2	11.1	-3	1	-1	-9	-20
4	19.1	2	14.5	-9	1	3	0	-6
5	25.9	5	20.0	-18	-1	4	5	3
6	28.5	4	21.0	-21	-2	4	6	4
7	27.6	4	20.9	-20	-2	4	5	4
8	26.0	5	20.6	-16	0	4	5	2
9	24.3	6	19.2	-9	3	6	5	1
10	21.7	7	17.1	-2	6	7	4	-2
11	19.5	8	15.4	3	8	7	1	-7
12	17.5	10	13.8	9	10	6	-2	-13
13	15.9	13	12.5	14	11	4	-7	-20
14	14.8	18	11.7	19	12	2	-11	-28
15	14.1	25	11.1	24	13	1	-16	-35
16	13.3	27	10.4	25	11	-2	-21	...
17	12.9	29	10.0	25	9	-5	-25	...
18	12.1	31	9.3	23	6	-10	-32	...
19	11.6	31	8.8	22	3	-13	-37	...
20	12.7	30	8.6	25	8	-7	-28	...
21	12.1	29	8.4	22	5	-11	-33	...
22	11.4	23	8.0	16	0	-15	-37	...
23	11.1	14	7.9	10	-1	-16	-36	...
24	12.2	9	8.8	9	1	-9	-25	...

VK EAST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	33.2	12	27.5	0	13	17	18	16
2	33.0	11	25.3	-2	12	16	17	16
3	32.8	11	25.5	-3	11	16	17	15
4	33.0	11	27.3	-2	12	16	17	16
5	33.0	12	27.1	1	14	18	18	17
6	32.7	13	26.6	5	17	20	20	17
7	31.9	14	25.7	13	21	23	21	18
8	30.9	16	26.0	25	29	28	24	20
9	30.1	19	24.0	42	39	35	29	22
10	29.0	20	23.1	45	40	35	28	21
11	27.9	20	22.2	45	39	34	27	19
12	27.1	21	21.5	45	39	33	26	17
13	25.9	21	20.5	45	38	32	24	14
14	23.9	22	19.1	44	36	29	19	9
15	21.8	23	17.1	42	33	24	13	1
16	20.1	23	15.8	40	29	20	7	-7
17	17.8	24	13.9	36	23	12	-3	-21
18	15.3	26	11.9	30	14	0	-20	...
19	15.6	26	12.0	31	16	1	-18	-39
20	17.0	26	13.1	35	22	9	-7	-25
21	22.0	20	17.4	33	28	22	13	2
22	30.4	15	23.6	20	25	25	22	18
23	34.1	13	27.4	10	20	23	22	20
24	33.6	12	27.3	4	16	19	20	18

VK EAST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	34.8	23	29.4	28	33	34	33	30
2	34.3	23	28.7	28	34	34	33	30
3	34.2	23	28.3	30	35	35	33	30
4	33.9	24	27.7	33	36	36	34	31
5	33.1	25	26.8	37	39	38	35	31
6	31.8	27	25.5	44	43	41	37	32
7	30.2	29	24.0	50	46	42	37	31
8	28.3	30	22.4	51	46	42	36	29
9	26.5	31	21.0	51	46	41	34	27
10	24.7	32	19.6	51	45	39	32	23
11	23.3	34	18.4	51	44	38	30	20
12	21.9	35	17.3	50	42	36	27	17
13	20.2	36	16.0	49	41	33	23	12
14	18.7	37	14.7	47	38	30	19	6
15	17.6	38	13.7	46	37	27	15	2
16	16.0	39	12.4	44	33	22	8	-5
17	14.3	41	11.0	41	28	16	1	-15
18	15.1	40	11.5	43	30	19	5	-10
19	19.8	34	15.0	44	37	30	21	10
20	26.6	28	20.5	39	39	36	31	24
21	32.0	25	25.1	35	37	36	34	30
22	34.7	24	27.7	32	36	36	34	31
23	35.0	23	28.5	29	34	35	34	31
24	35.1	23	29.1	28	34	35	33	30

VK EAST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.1	7	25.4	-25	-3	4	8	8
2	28.2	8	22.3	-13	3	8	10	8
3	25.8	10	20.5	-1	9	12	11	7
4	24.1	14	19.1	11	17	16	13	7
5	23.1	17	18.3	22	23	20	14	7
6	22.4	21	17.7	32	28	23	15	6
7	21.2	23	16.8	36	30	23	14	3
8	20.3	24	15.9	37	29	22	12	0
9	18.9	26	14.7	37	28	19	8	-4
10	17.2	27	13.3	35	25	15	2	-13
11	15.9	28	12.2	33	21	10	-4	-21
12	16.2	28	12.4	34	22	12	-2	-19
13	20.0	25	15.8	38	30	22	11	0
14	19.1	22	14.8	30	24	17	6	-5
15	17.5	18	13.5	21	17	11	1	-10
16	16.1	10	12.5	9	9	4	-5	-18
17	14.2	1	10.9	1	2	-2	-12	-25
18	14.9	-4	11.4	-6	0	-2	-9	-20
19	19.5	0	14.8	-16	-2	0	-1	-6
20	26.2	3	20.2	-28	-7	0	3	2
21	31.3	5	24.6	-37	-11	-1	4	5
22	31.1	5	23.8	...	-12	-2	4	6
23	31.2	6	26.0	-39	-12	-1	4	6
24	31.7	6	25.5	-35	-9	0	6	7

VK EAST - USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.6	14	10.7	14	9	2	-10	-25
2	15.3	10	11.6	9	8	2	-7	-20
3	20.1	10	15.9	6	11	9	4	-3
4	27.2	9	20.3	-1	10	12	11	7
5	29.2	7	21.6	-9	5	9	10	8
6	29.8	6	21.7	-13	3	8	9	7
7	29.7	6	21.4	-14	2	7	9	7
8	28.7	6	20.5	-12	3	8	9	6
9	27.1	7	19.1	-6	6	9	9	5
10	25.3	8	17.7	0	9	11	9	4
11	22.6	9	15.8	5	11	11	6	0
12	19.9	11	13.8	9	12	9	2	-6
13	17.9	13	12.4	15	13	8	-1	-13
14	15.9	17	11.0	20	13	4	-8	-24
15	14.9	23	10.2	25	14	2	-14	-32
16	14.0	26	9.6	25	12	-1	-19	...
17	13.2	28	9.2	25	9	-5	-25	...
18	12.5	29	8.8	23	6	-10	-32	...
19	11.8	30	8.4	21	2	-15	-39	...
20	11.7	30	8.4	21	2	-15	...	...
21	12.8	30	9.0	25	8	-7	-28	...
22	12.1	28	8.5	21	4	-12	-34	...
23	11.8	22	8.5	16	1	-13	-34	...
24	13.0	16	9.5	15	5	-6	-23	...

VK STH - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.3	9	23.8	-4	9	13	13	10
2	29.3	9	24.3	-6	8	12	12	10
3	28.7	8	23.2	-8	7	11	11	9
4	28.3	8	23.7	-7	7	11	11	8
5	28.1	9	23.2	-5	8	12	11	8
6	27.6	9	22.6	0	11	13	12	8
7	26.8	11	21.7	6	14	15	13	8
8	25.4	12	20.3	15	19	18	13	7
9	23.8	18	18.9	34	29	24	15	5
10	21.5	19	17.1	36	28	20	9	-3
11	19.8	20	15.7	35	25	16	3	-12
12	17.9	21	14.2	33	21	9	-6	-24
13	16.6	22	13.1	31	16	3	-15	-36
14	15.6	23	12.3	28	12	-3	-23	...
15	14.7	23	11.6	26	8	-8	-31	...
16	13.9	24	10.9	23	3	-15	...	...
17	13.5	24	10.5	21	0	-19	...	...
18	12.6	25	9.7	16	-6	-28	...	...
19	11.7	25	9.0	11	-15	-39	...	...
20	12.7	25	9.7	17	-5	-27	...	...
21	16.4	22	12.4	30	15	2	-16	-37
22	21.7	12	16.7	16	17	13	6	-4
23	26.1	11	20.5	8	15	15	12	7
24	28.7	10	22.9	1	12	15	14	10

VK STH - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.6	13	22.1	17	21	20	16	9
2	26.2	13	22.2	17	21	20	15	8
3	25.9	13	21.7	19	22	20	15	8
4	25.7	14	21.3	22	24	21	15	8
5	25.3	15	20.7	26	26	23	16	8
6	24.5	18	19.6	34	30	25	17	7
7	23.0	21	18.2	40	33	26	15	4
8	20.8	23	16.5	40	31	22	9	-4
9	19.2	25	15.2	39	28	17	3	-12
10	17.4	26	13.8	37	24	11	-5	-23
11	15.7	28	12.4	33	18	3	-16	-38
12	14.3	29	11.3	30	12	-4	-27	...
13	13.3	30	10.5	26	7	-11	-36	...
14	12.7	31	10.0	24	3	-16	...	...
15	12.0	32	9.4	21	-1	-22	...	...
16	11.6	32	9.0	19	-4	-26	...	...
17	10.9	33	8.4	16	-10	-34	...	...
18	10.4	34	7.9	12	-15	...	...	...
19	11.4	26	8.6	15	-6	-27	...	...
20	14.4	19	10.8	20	8	-4	-23	...
21	18.8	16	14.4	21	17	10	-1	-15
22	22.7	14	17.7	20	20	17	9	0
23	25.3	13	20.1	18	21	19	14	6
24	26.3	13	21.4	17	21	20	15	8

VK STH - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	32.1	8	24.4	-25	-3	5	9	9
2	30.2	10	24.0	-13	4	10	12	11
3	28.0	12	22.2	0	12	15	14	11
4	26.4	15	20.9	12	19	19	16	12
5	25.5	18	20.2	24	25	23	19	12
6	24.8	20	19.6	33	31	27	20	13
7	23.5	23	18.7	38	33	27	20	11
8	22.3	24	17.5	39	33	26	17	8
9	20.5	25	16.0	39	31	24	13	2
10	18.5	27	14.4	37	28	19	7	-5
11	16.6	28	12.8	35	24	14	0	-15
12	16.5	27	12.9	33	21	10	-4	-21
13	15.7	27	12.4	31	19	7	-8	-26
14	14.8	22	11.6	23	13	2	-13	-31
15	14.4	15	11.1	15	9	0	-14	-31
16	13.5	5	10.4	6	3	-4	-17	-32
17	12.7	-4	9.7	0	0	-6	-18	-32
18	14.0	-6	10.6	-6	-1	-4	-11	-23
19	18.1	-2	14.2	-14	-2	0	-3	-9
20	23.8	2	18.1	-26	-6	0	2	0
21	28.8	3	22.4	-36	-10	-1	3	3
22	32.0	4	25.5	...	-12	-2	4	5
23	33.1	5	26.9	...	-12	-1	4	6
24	33.4	6	27.1	-35	-9	0	6	7

VK STH - USA/CARIBBEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.5	19	10.2	18	8	-3	-20	-39
2	14.8	14	11.3	15	10	2	-10	-25
3	19.5	12	15.4	11	13	10	4	-5
4	26.4	11	20.4	4	13	14	12	8
5	29.7	7	22.3	-5	8	12	12	9
6	29.4	7	24.7	-9	5	9	10	8
7	29.2	6	24.2	-11	4	8	9	7
8	28.8	6	23.5	-11	4	8	9	6
9	27.8	6	22.5	-9	5	9	9	6
10	26.2	7	20.9	-4	7	10	8	4
11	24.4	9	20.7	3	11	11	8	3
12	21.8	11	17.2	11	14	12	6	-1
13	19.6	14	15.5	17	16	11	3	-7
14	17.6	19	13.9	23	18	10	-2	-15
15	16.0	24	12.6	28	18	7	-8	-25
16	14.9	26	11.8	28	16	3	-14	-33
17	14.2	28	11.2	28	14	0	-18	-39
18	13.4	29	10.5	27	11	-3	-24	...
19	13.0	30	10.1	26	9	-6	-27	...
20	12.2	31	9.4	23	6	-11	-34	...
21	11.7	32	8.9	22	3	-15	-39	...
22	12.9	30	9.8	26	9	-7	-28	...
23	13.1	30	10.1	26	11	-4	-25	...
24	12.3	26	9.4	20	5	-9	-30	...

VK WEST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	33.4	13	26.7	5	17	20	20	18
2	33.2	12	27.0	1	14	18	19	17
3	32.8	12	27.1	-1	12	17	18	16
4	32.4	12	25.0	-2	12	16	17	16
5	32.4	11	27.0	-1	12	16	17	15
6	32.4	12	26.8	1	14	18	18	16
7	32.2	12	26.4	6	17	20	19	17
8	31.7	13	25.7	12	21	22	21	18
9	30.6	15	24.6	22	27	26	23	18
10	29.5	18	24.7	36	34	31	26	19
11	28.0	19	22.3	39	36	31	25	17
12	26.6	19	21.2	41	36	31	23	15
13	25.2	20	20.0	42	36	29	21	11
14	24.2	21	19.2	44	36	29	19	8
15	23.0	21	18.2	43	34	26	16	4
16	21.4	22	17.1	41	31	22	10	-3
17	19.7	22	15.5	38	27	17	3	-12
18	18.4	23	14.4	36	24	12	-3	-20
19	16.5	23	12.8	32	17	3	-15	-36
20	14.5	24	11.2	26	7	-10	-33	...
21	15.1	24	11.6	28	10	-5	-27	...
22	19.8	20	15.6	34	25	16	3	-11
23	26.5	14	20.6	20	23	22	17	11
24	31.4	13	24.8	12	20	22	21	17

VK WEST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	32.1	9	26.0	2	14	17	16	14
2	32.4	9	26.8	2	13	17	17	14
3	31.8	9	23.9	3	14	17	16	14
4	31.4	10	26.3	5	16	18	17	14
5	31.1	11	25.7	10	19	20	18	14
6	30.5	13	24.7	19	24	24	21	16
7	28.8	15	23.0	28	29	27	22	16
8	26.9	18	21.3	35	33	28	22	14
9	24.1	21	19.1	40	34	28	19	9
10	22.0	23	17.4	40	32	25	15	4
11	19.8	25	15.7	39	30	21	9	-3
12	18.3	27	14.4	38	27	18	4	-10
13	17.0	28	13.5	36	25	14	-1	-17
14	16.0	29	12.6	34	22	10	-6	-24
15	15.2	30	12.0	33	19	6	-11	-30
16	14.4	31	11.3	31	17	3	-15	-36
17	13.9	31	10.7	30	15	1	-18	-39
18	13.0	33	9.9	28	12	-3	-24	...
19	12.5	28	9.6	23	7	-7	-29	...
20	13.8	20	10.5	20	10	-1	-18	-38
21	17.6	16	13.9	19	16	9	-1	-14
22	23.1	13	17.7	15	18	16	10	3
23	27.8	11	21.7	8	16	17	15	10
24	31.0	10	24.6	4	15	17	16	13

VK WEST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.9	6	25.2	-38	-11	0	5	7
2	27.9	7	22.1	-28	-5	3	7	7
3	25.4	8	20.1	-18	0	6	8	6
4	23.6	10	18.7	-6	7	10	9	6
5	22.4	13	17.8	4	13	14	11	5
6	21.7	16	17.1	14	18	17	12	5
7	20.5	21	16.3	25	23	19	12	3
8	19.7	24	15.4	32	27	21	12	1
9	18.5	27	14.4	35	28	20	9	-3
10	16.9	29	13.1	35	26	16	4	-10
11	15.8	30	12.2	35	24	13	-1	-17
12	16.3	30	12.4	36	25	15	1	-14
13	17.4	28	13.7	36	26	16	3	-11
14	16.3	25	12.8	29	20	11	-2	-17
15	15.5	19	12.3	21	15	7	-5	-19
16	14.8	13	11.6	13	10	3	-8	-21
17	14.5	5	11.3	4	6	1	-8	-20
18	13.6	-3	10.5	-2	2	-1	-9	-21
19	12.8	-12	9.8	-6	0	-2	-10	-21
20	14.1	-12	10.7	-11	-2	-1	-6	-15
21	18.3	-5	14.4	-23	-5	-1	-1	-5
22	24.1	1	18.5	-35	-11	-2	1	1
23	29.0	4	22.7	...	-15	-4	2	4
24	31.6	5	25.4	...	-15	-3	3	6

VK WEST - USA/CARIBBEAN

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● AMIDON FERROMAGNETIC CORES: For LF/HF/VHF/UHF applications. Send DL size SASE for data/price to RJ & US Imports, Box 431, Kiama NSW 2533 (no enquiries at office, please ... 14 Boanyo Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscott Electronics, Melbourne.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution short-wave weatherfax, morse & RTTY receiving program. Needs CGA, SSBhf radio & Radfax decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2, but suitable for Hercules, EGA and VGA cards respectively, $35. SATFAX is a NOAA, Meteor and GMS weather satellite picture receiving program. Uses EGA or VGA modes. Needs EGA or VGA colour monitor and card, and Weatherfax PC card, + 137MHz receiver, $45. All programs are on 5.25" or 3.5" disks (state which) + documentation. Add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm, Qld 4005. Ph: (07) 358 2785.

FOR SALE - NSW

● C45 10m FM 25w xcvr complete, EC, $150. Oscilloscopes Telequipment D43R DB25MHz, $300. AN/USM24C 10MHz, $100. Telequipment p.i. units from $50. Signal Generators BC221AH AC PSU, $70. Marconi TF144H Ser II, $130. All ONO. Brian VK2KLH QTHR (02) 545 2650.

● HALLICRAFTER Communications Receiver SX100 Mark 2, good working cond, complete with manual. Also Eddystone Model 750 ditto genuine original vintage gear. What offers SNS 30135005 & G12423 Ian VK2CJP QTHR (02) 44 4985.

● 2M LINEAR AMPLIFIER Daiwa LA2065. Ga As preamp 50w output. EC. $185. John VK2KOK QTHR (02) 918 2911.

● TOWER 40' WINCH UP two sections, needs guys, plus bearing and plates. Steve VK2ASG AH (043) 24 1542, BH (02) 565 9730.

● AVO MODEL EIGHT Mark Five meter. Probes and accessories, including top grain hide carry case. Mint condition. Ser Num 81306. Best offer. Contact Martin Griffith (02) 868 1089 (AH), (02) 888 9371 (BH).

● HB HF LINEAR full legal power $120. Thomson 250A amber monitor, working, $45. Telequipment D43 double trace scope, good order, with full manual, $250. Toshiba T-100 computer. All software, colour monitor, $250. VK2WS QTHR (067) 75 2158.

● ICOM IC2GAT HANDIE as new, case, speaker mic, $500 ono. Swan 350C XC230 PSU new finals and driver, goes well, offers. New 4XC250B, 4CX250R, 4CX125C, 4CX350A 4X150. Robert VK2BBR QTHR (066) 21 2632 (BH), 066) 24 3445 (AH).

● YAESU FT-780R 70cm txvr (all mode) $400. Dave VK2KFU (02) 489 1810 after 7pm.

FOR SALE - VIC

● STANDARD C150E 2m h/held compl with ext mic/spk case extra ant access as new, $350. Tower 60' 2 sec self-supporting, $400. Rob VK3JE (060) 37 1262.

● ICOM 725 Transceiver with 500Hz CW filter fitted, as new in original packing, $1200. Icom R71A general coverage receiver, EC, original packing, $1300. Kenwood PS50 power supply, $300. Mirage MP1 SWR PWR meter, $150. ENB2 noise bridge, $50. EAT300 antenna tuner, $50. Peter VK3MEA QTHR (03) 428 2294.

● COLLECTOR ITEM. National HRO receiver, circa 1938 4B/S G/C coil boxes. Good, complete cond, but no power supply, $125 ono. Ron VK3OM QTHR (059) 44 3019.

● LARGE AWA TRANSMITTING VARIABLE CAPACITORS 190pF (2 ea), 300pF (3 ea), $20 ea. OBO. Also Roller Inductor, 0 to 24uHy with turns counting dial, $30. Drew Diamond VK3XU QTHR (03) 722 1620 evenings.

● SHACK CLEARANCE: Makita hammer drill, 600w 2sp 19mm chuck (brand new, still in box, never used), $240. 2-in-1 power supply +12v 5amp, +31v 3amp, $100. 2 +12v∆ -12v DC 312mA AC adaptors, $20 ea. 1 6v 100mA AC adaptor, $15. 1 Sendata 300 modem: 300BPS IBM PC or compatible, $120. 1 Pasom modem isolator: IBM PC or compatible, $130. 12 2v 200 AH lead acid cells, $20 ea or 6 for $100. 8 6v 90 AH lead acid cells, $30 ea or 2 for $50.. 2 12V 50 AH gel cells (brand new), $120 ea. Great power supplies! Evan VK3EJV (03) 438 2878.

● YAESU FT707 HF xcvr with mic & mobile mount, VGC, $825. Dentron American ATU 160/10m. 300W bal or unbal output, $125. Hidaka 10/15m 3EL beam with balun, $125. Chimside 80/10m trap vert EC, $100. Kenwood 7200 2m FM. 7ch fitted inc RTTY. $135. Ron VK3OM QTHR (059) 44 3019.

● FRG7 WITH Digital Readout fine tune CW filter wideband filter supplied, workshop manual, seriel no 120097, $220. Bob (03) 541 5458 BH.

● ARGONAUT QRP txvr, very good, $350. Linear Heath USA two Cetron 572Bs with PS switched to 2kv with meter, $750. Audio Generator 300 cps to 50 kc Advance, $50. Frequency meter BC221 230v, exc, $50. Voltohmst AWA, $40. TV camera Philips video and RF output with Schneider 1.4 lens, $200. Vibrators. Old dial glasses and telephones. Enquire. Air compressor mobile, $200. Drill press, $80. VK3DS QTHR (053) 32 3226.

● OFFERS invited for YAESU FT757GX11, FP757HD with speaker and MD-1 mic. This rig has worked 267 countries this year. Immaculate, as-new cond, Aug 31 closing date for offers, Roth VK3BG (03) 725 3550.

● RACKS with doors 6ft high (2 off), $30 ea. VK3AGW Arnold, Belgrave. (03) 754 4111 AH.

● EIGHT-ELEMENT Log Period beam ATN, VGC, complete with balun. Also scanner SC7000 SE1CO with antenna also UHF handheld CB. (051) 99 2811 BH or 018 513 108 AH.

● ICOM IC751 HF txvr with mike, manual, original carton, $1700. Yaesu FT290R all mode VHF PC shack use only with Nicads speaker mike and bracket, $510. CB txvr Cobra 148GTL with mike, hardly used, $210. Comm rcvr Sony ICF2001 with power supply PC, $250. Icom IC-02N HH 140-152MHz speaker mike, $340. Yaesu scanner FRG9600 with manual & workshop manual, original carton, PC, $770. Yagi 5el beam tribander, $450. Yagi 6el beam duobander 10-15m, $180. Yagi 3el 10-11 beam new, $115. ATU roller coil tuner, 2kW $200. VHF 2M linear input 300mW O/P 40 watts, $105. Monitor Scope YO-100 PC, as new, $320. BWD, CRO dual tracer 35MHz, $650. Home brewer HF linear 1kW pep 2XQB3/300 and 2 spares, $900. All antennae Werner Wulf VK3AXJ QTHR.

FOR SALE - QLD

● BIRD 43 POWER METER, $500. Philips power meter & dummy load (reversible) for 477MHz band, $300. VK4DY QTHR.

● OLD VALVES - radio TV - transmitting - some test equipment. Send for list or send your list (SAE). Old valve radio circuits (copies) available. VK4DY QTHR.

● FILTER CAPS 450 volt 2000UF, $10 EA. 6 VOLT 110 AMP HR gel-cells, $30 ea or $55 pair. PSK Packet Modem fits PK232, $130. UHF cavities 70dB isolation at 5MHz, $130 ea. Mick VK4BMT (074) 98 2176.

● G4ENA FAST SCAN to slow scan converter, needs completing, all parts & constructional details supplied, $150. RF Generator Heathkit, $35. video Camera monochrome Nolens, $40. TV mast top amp VHF/UHF, $35. Audio Generator Heathkit, $50. FET tester, $25. Sony V ideo recorder Beta (needs new heads), $50. TV tcvr 70cm, $100. Inverter 12V DC to 270V DC, eq-equipment, $10. P & P extra. All items. VK4ZFQ (077) 79 4641. NOT QTHR.

● YAESU FT747 fine cond, $950. Yaesu FC757AT, never used, brand new, 18 mths MFT own guarantee, $600. All with manuals. Steve VK4DDB from 7pm to 8pm (07) 261 1711.

FOR SALE - SA

● POWER SUPPLY ideal super linear or B/C station Genelec transformer WE filter complete two HI PR chokes, rectifiers, filament transformer, unassembled, $150. Complete new price transformers, $600. VK5DC QTHR (08) 31 4194.

● TWO KENWOOD TH-215A-2M-VHF-FM handhelds, s/nos 909434 9090424 c/with Ken PB1 and BC8 battery packs & chargers, all brand new, $450 ea complete set. VK5NCB (085) 52 2340.

● YAESU FT726R VHF/UHF allmode base, 2m only fitted, s/n 220208, as new, with mic, manual and technical manual, $900. Phil VK5AKK (08) 381 5427.

● EICO HF txvr 80/40/20 200 watts base or mobile, has manuals and spare finals, slight relay fault on vox. Comes complete with power supply. A cheap first rig. Contact Doc c/- VK5BWR (086) 45 4168.

FOR SALE - TAS

● YAESU FT2700RH 25W FM 2m/70cm txvr with voice synthesizer option. As new cond, little use, $600 or swap for Yaesu FT690 Mk 2. Damien VK7CDI (003) 95 4153 AH.

● PRESIDENT HR-2510 txvr, mint cond, 5 mths old, unmod original packing, ser no 95000653, $300. Clarrie VK7HC (004) 31 8211. Licensed amateurs only.

WANTED - ACT

● HF TRANSCEIVER 100W SS, prefer less complex unit for extended portable operation. Mike VK1VW (06) 274 6640 BH, (06) 254 4784 AH.

WANTED - NSW

I ARC-5 COMMAND gear, especially BC RX coil set, cable connectors, splined tuning cables andmountings. TRC75 modules, especially SG179A-URC oscillator. PRC77 add-ons, especially OA3633 amplifier & mounting. Brian VK2KLH QTHR (02) 545 2650.

● MICROLOG AIR-1 RTTY & AMTOR cartridge for Commodore 64. Norbert (049) 61 1247.

● CIRCUIT DIAGRAM or manual for Cossor Model 339 oscilloscope copying costs paid. Nick VK2AOH QTHR (063) 62 5229.

● TUNING CRANK for Command Receiver, also CW filter for FT101E. VK2DHK Doug QTHR (063) 31 7775.

● MACHINE to HAND WIND honeycomb and PI wound coils, Horrie VK2LY QTHR (02) 858 4950.

● TECHNICAL manual AN/ARC49 or AN/ARC3, also ARC49 transmitter, control and junction boxes, and connecting cables. All costs refunded. Peter VK2CPK QTHR (02) 411 1227.

WANTED - VIC

● VALVES: 12v hybrids, types 12AD6, 12AE6, 12BL6, 12FK6, 12K5, 12F8, 12U7. Battery series, types 1T4, 1R5, 1S5, 1U5, 3S4, 3V4. Bruce VK3YBW QTHR (03) 527 2661 after 6pm.

● VERTICAL ANTENNA four band 15-80m Chirnside CE-5SS or similar. John Fullagar VK3AVY QTHR (03) 758 2358.

WANTED - QLD

● MANUAL OR CIRCUIT of solid state modules SSM Europa-B transverter. Also Racal RA-121B independent sideband adapter operating handbook circuit AWA Voltohmyst 1A56074, any info on linear type unknown has EEC on circuit boards. John VK4DJS QTHR (070) 91 2705.

● FLASHING SIGNAL LAMP bulbs (sealed multi-filament) for Grimes US Aircorps type C3A signalling lamp, approx 150mm diam type GE/MAZDA 4521 26v 5.3A or 13v 6.6A par 46. Restoring 2 RAAF AT5/AR8 wireless sets, require parts lists and alignment details or copy of handbook, also 12v or 24v genemotors VK4EF ex WWII Signaller, 97 Jubilee Tce, Bardon, 4065. (07) 366 1803.

● CIRCUIT AR88LF receiver, all costs paid. VK4CF QTHR (07) 355 3969.

WANTED - SA

● MANUAL FOR TRIO comm rcvr, model JR60, pay $10. VK5BO QTHR (08) 47 5696.

WANTED - TAS

● ICOM IC-02A handheld 144MHz, FM transceiver, going or not. I specifically require keyboard and LCD display for the above. (002) 49 3988 after 4pm daily.

Stolen Equipment

Stolen from VK2IT David Woollett, 12 Broadarrow Rd, Beverly Hills on the night of 7/8 August 1991. Swan MB40 serial no 16471. Yaesu Musen transceiver FT101B serial no 320376, and desk microphone. Yaesu Musen receiver FRG7, serial no 8HH210862. ICOM IC 560 6m transceiver, serial no 02057 with microphone. ICOM IC211 2m transceiver, serial no not known, with microphone. Philips FM321 70cm transceiver (FM), serial no 156, with microphone.Digital frequency counter, Goodwill Instrument Co type, GFC-8055FF, serial no 2020452. Contact Joyce Woollett, (02) 764 2855 (work).

Stolen on the evening/early morning of 15/16 July 1991 between 10pm and 1am, a YAESU FT4700RH Duobander, s/n 9C 212240 from a car in East St Kilda. It is missing a microphone and power lead. It has no identifying markings. Contact Michael Weinstock VK3EMJ, 9 Los Angeles Court, Ripponlea 3183. Phone (03) 531 9954 home; parents' work (03) 363 1026.

A Yaesu FT-212RH 2m transceiver, serial number IC630020, was stolen from a car in the Penrith area, about two weeks ago. If this equipment is seen, please contact the Penrith Police Station, or Mitch VK2XMM on telephone (02) 623 4787, or the various Sydney 2m repeaters.

Stolen from Brian Edwards VK3XBE on Sunday 28 July 1991 from his home at 24 Etnam St, West Preston. Phone (03) 484 2171. AEA PK-232 Pakratt multi-mode TNC S/N 19092; Aurex PC-X88AD black cassette deck; Daiwa 2m/70cm cross-needle SWR meter; Daiwa CNW-419 antenna tuner; Icom IC-271A 2m all-mode transceiver, S/N 27402603; Icom IC-471A 70cm all-mode transceiver, S/N 20801900; Icom IC-1271A S/N 001398; Icom IC-745 HF transceiver, never been on air; Icom IC-R70 communications receiver, S/N 18503539; Icom IC-R7000 communications receiver, S/N 002670; Icom IC-2M6 desk microphone, S/N 20507750; Icom IC-PS30 power supply, S/N 20302017; Microwave Modules 70cm 50W amplifier, model MML-432-50; Mirage 2m 150W and 60W amplifiers; Teac CD player; Tono terminal Theta-550, S/N 821485; Weller desoldering station; Weller soldering station; Yaesu FT-2084 2m FM HT; Yaesu YP-150 dummy load/power meter. If you have any details or reason to suspect that you have been approached by someone trying to sell some of this equipment, please immediately contact Senior Detectives Robyn Larkman or Glen Wilson at Preston CIB on (03) 479 6129.

Stolen from Keith Kennedy VK2PRK, 2/433 New Canterbury Road, Dulwich Hill 2209, YAESU transceiver FT7 ID NSW 718610 Kenwood. SMC/30 hand-held mike and speaker. Contact Marrickville police or owner (02) 569 6171 (home) or (02) 560 9999 (work).

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300,
Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

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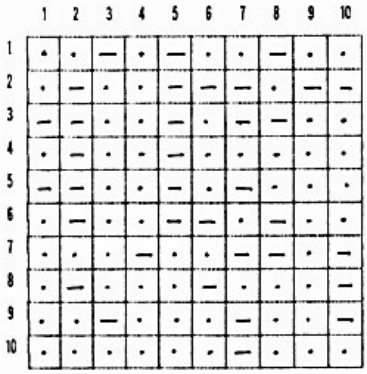
Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 54 P 45



Across: 1 earl; 2 enemy; 3 merge; 4 reds; 5 gale; 6 race; 7 steak; 8 last; 9 fix; 10 isle.

Down: 1 Innes; 2 atol; 3 bier; 4 hits; 5 Mons; 6 real; 7 wry; 8 cab; 9 leis; 10 lug.

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

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Call Sign (if applicable): .....

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